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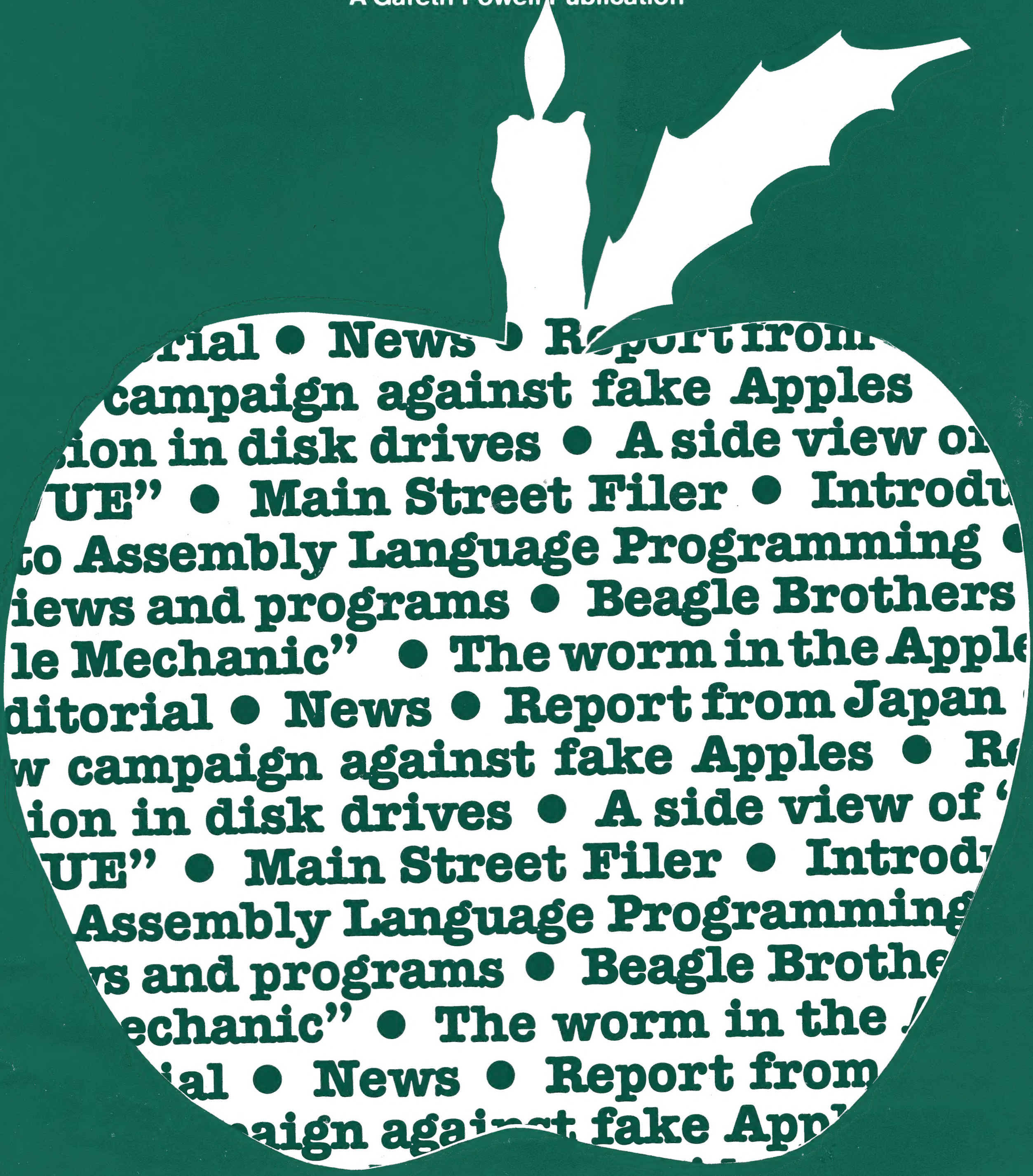
The Australian Apple Review

A Gareth Powell Publication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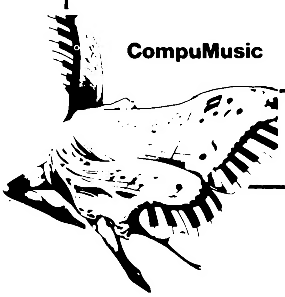

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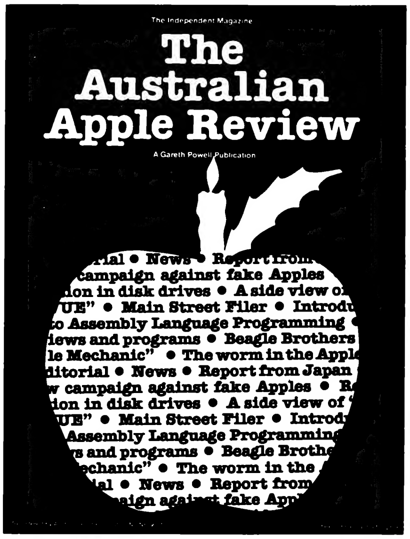

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Editor: Gareth Powell
Art Director: Roy Bisson
Production: Brenda Powell
Subscription Manager:
Tina Spathos

Advertising Enquiries:
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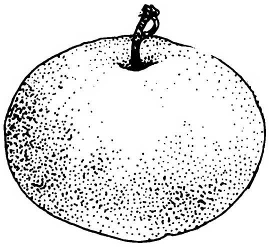
Editorial



I am not too strong on Greek and Roman mythology, but I do remember that always hanging around the fringes of the action were a set of desperates chanting "Woe, woe, a thousand times woe."

We have the same desperates hanging around the computer industry – they are called newspaper computer columnists. They take the greatest possible delight in heralding the demise of the personal computer industry.

Although I am a newspaper computer columnist, I am almost alone in taking a singularly optimistic view of the future.

I may have had the passing moment of doubt about a single machine – I was not overenthused by the Macintosh in its original incarnation – but the industry as a whole is in fairly robust health.

And there is a very good reason for this. Personal computers have consolidated their position in both home and commercial use and are continually spreading into new markets.

For my sins I write a column for the advertising industry. (Most people who work for advertising agencies have gone into that industry as a last resort. In the same way that English families used to make the idiot son join the church, so too with advertising agencies.)

People who work in advertising agencies are not like you and me. They are strange. It would be wrong to mock. Sympathetic pity is the note to strike.

And they are not without hope of salvation. For I have been able to talk many advertising executives into buying a personal computer so that they can function more efficiently.

And advertising is but one of hundreds of industries which are embracing computers with open arms. Which means that the personal computer continues to go from strength to strength as it becomes even more an essential part of daily life.

In the vanguard of this revolution is the Apple in its various forms. How anyone can be pessimistic about the future of the Apple I do not know. Either they don't read the sales figures or they are congenitally depressed.

1985 will be a great year for the personal computer industry. It will be an even greater year for Apple. ☐

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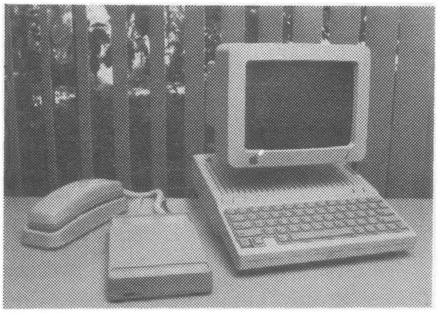
News

Call me modem

Telecommunications is where it's all at. Now Apple have announced a Modem 1200 which gives you standard 300 baud or 1200/75 communication. It is a handsome looking beast and is a spitting image of the American model which was designed to go under a standard Bell telephone.



The modem will receive Viatel service when it is introduced in February, and will also work with either Australian or American communication standards. The modem was designed and made by NettComm in Ryde, NSW, who can take a large bow, centre stage with spotlight and flowers.

Price of the modem is $750, cheap for a machine with full auto-originate, auto-dial and auto-answer facilities.

The PR release (from the famous pen of Burson Marsteller, a company dedicated to the death of the English language in this century) coyly suggests "An Apple accessory kit will allow the modem to be connected to many competitive personal computers where this facility is required."

As far as we know this is the first time Apple have ever publicly acknowledged that there were competitive personal computers. Perhaps they are at long last attaining maturity.

All that Jazz

Lotus 1-2-3 became overnight the fastest selling business computer program in the world. The reason was simple. It was integrated, which meant you could operate a database and a spreadsheet (plus a rudimentary word processing system and a chart capability) from one program disk. This was generally considered A Good Thing.

Now Lotus have introduced a program called "Jazz" especially for the Macintosh.

One presumes that the executives at both companies are not aware of the etymological origins of the word "jazz". It originally meant the greatest experience that members of the opposite sex could enjoy together when in extremely close proximity. As in "Jazz me, baby".

Jazz will only work on a fat Mac, so if you haven't got the 512 K version or if your slim Mac hasn't been upgraded, this program is not for you. You must also have an external disk drive.

In fact, if you have a Mac and you don't have the full memory and the external disk drive, then you are wasting about 70% of the machine's capability. True.

At its launch Apple admirers went into the hyperbole which is expected of them.

Mike Murray, director of marketing for the Mac in the States, burbled, "Jazz will quickly become one of the most popular integrated business software products on the market. It combines highly useful and sophisticated business capabilities with Macintosh's superb user interface, creating a powerful solution for business users in all sizes of companies. It's a great product, and one which will set a standard against which other integrated business packages will be measured."

When he refers to "superb user interface" we presume he is referring to the word "jazz" in its original sense. Bless the lad, we are sure he means well.

Jazz will be here in a few weeks but no-one has yet fixed the price.

The existence of this program will make a major difference to the way the Macintosh is accepted in corporate America and we would not be surprised to see integrated programs such as "Easy Access" and "Framework" becoming available on the Mac in the near future. Watch this space for further details.

An Apple for the teacher

Although Apple are undoubtedly all for education, one sometimes gets the impression that they, as yet, have not totally got their act together. Perhaps it is the way in which they communicate what they are doing.

Take the case of the cut price Apples for university students. If Apple had come out and made a bold statement showing how they were going to supply undeserving uni students with machines at half price, no one would have created that much of a stir. Instead, they let the news leak out through their dealers, especially those sited near a university. These dealers were not biased in the favour of Apple. Indeed, the opposite.

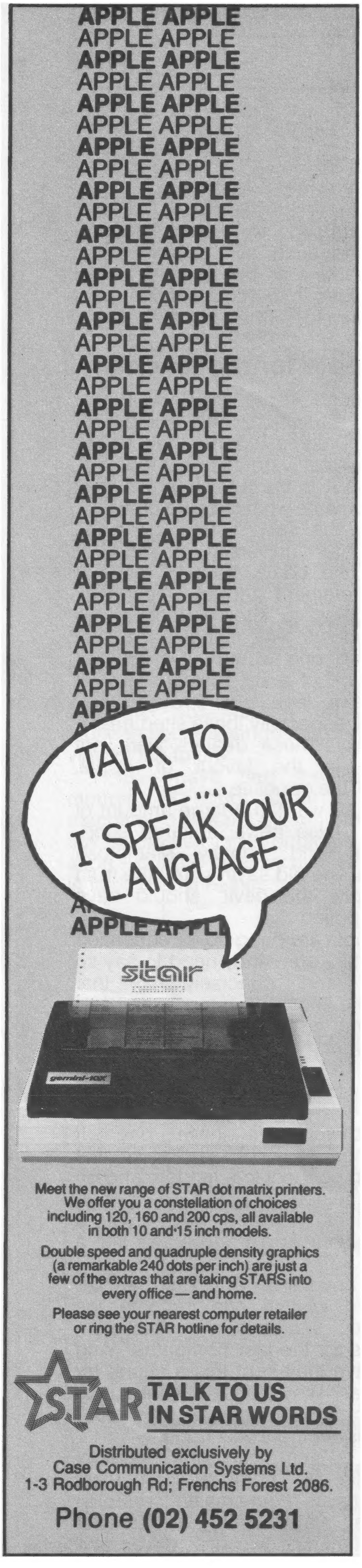
And so we had a large amount of rumour, false news, agitated shopkeepers and uneasy Macintosh owners. The old saying "Tell the truth and spite the devil" should have been applied.

If Apple are gung ho for education – and they are – they need to say so clearly and concisely so that everyone knows what they are at and why. That is simply not the case at the moment.

The Melbourne company of MacLagan, Wright and Associates makes the "Digicard" which is neat and clever. We have one. It combines an RS232 socket so that you can connect to a modem and on to a telephone plus a printer Centronics interface. Saves you a slot on your Apple and works like a dream.

The news from Apple is that "the Digicard system has become the de facto standard in Australian schools for the last 12 months." And why have they kept this a secret for one year? Why didn't they announce it much earlier? We listen for a reply. And answer there was none.

The system can link together 28 Apple IIe personal computers and consists of one master controller and a slave unit. The master controller uses two disk drives and connects to the students' machines



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and also to a printer.

The network will work simultaneously (all together, lads) or sequentially.

It is offered as an eight pack with a master controller and eight Apple IIe machines, monitors, 80 column cards, Digicard slaves and cables for $13,000 to schools or $15,750 to you because of the sales tax. An extra four machines costs $5,570 for schools.

We are itching to try this set-up because it appears to us that it may well have business applications. And if it has been going for a year, all the bugs will have been sorted out by now.

In the beginning was The Word

Microsoft have had to stop calling their wordprocessing program "The Word" because there is a Biblical database in the United States of the same name. Instead they now refer to it as Microsoft's Word. Never mind, Linda, it will always be The Word to us.

Shortly we should see it available for the Macintosh where it will be challenging MacWrite. It will win hands down if the user is seriously using the Macintosh as a wordprocessor, simply because The Word is packed full of professional features.

The current version available in the United States lacks the style sheets which made The Word so powerful on the IBM, for which it was originally written. They were left off because at that time the Fat Mac was not available. Now the Fat Mac is alive and well you can expect to see a version of The Word with all the bells and whistles built-in.

One special feature of this program is that it produces proportional spacing on the screen and will also allow you to elect true type fonts. When the new Apple laser printer is announced in January, as it will be, it seems very likely that the Word and the Mac and the laser together will produce letter quality typing and possibly, printable quality typesetting. We can hardly wait. ☐

New Apple sales director

Mr Denis Bignold has been appointed to the new position of director of sales and marketing of Apple Computer Australia.

Priority areas for Mr Bignold are seen as direction of reformulated sales/marketing team approaches to the company's national dealer network, and major account sales activities.

MacProject now available

MacProject, now available from Apple dealers, is a powerful business solution that enables the user to draw a project schedule on the screen, enter project beginning dates and required task completion dates, resources, and fixed and variable cost data for each task. MacProject then calculates the beginning and ending dates for each task as well as for the entire project.

Its features include:

*the representation of project schedules and status through schedule, task, resource and tabular charts;
*the ability to calculate and adjust fixed costs, variable costs, and income with tabular display of total costs and net cash flows;
*the calculation of the critical path, or the succession of tasks that determine the final completion date of the project;
*a "what-if" analytical capability that allows instant recalculation of dates, resources, and costs if variables are introduced into the project;
*easy graphic modification of the project tasks and dependences;
*cut and paste ability into other project schedules or into files created with MacWrite, and ability to transfer costing data to Multiplan. ☐

Report from Japan

倫敦漱石

by Gareth Powell

The computer press delights in warning us that the Japanese will eventually dominate the world's computer markets and that their fifth generation computers will sweep all before them. The story seems to be that the Japanese are set to do in the field of personal computers what they did in motorcycles.

I don't think so. Not yet, not in the foreseeable future, and perhaps never.

I've just returned from Japan, where I have been looking at the computer scene. It is a beggar's muddle.

The Japanese computer industry needs to go through a radical series of changes before it will present a serious challenge in personal computers right across the board.

There seem to be two reasons for this – language and education.

For a computer to be acceptable in Japan it must be able to turn out something like 3,000 different characters in kanji, katekana and hiragana – the Japanese method of writing. This is a programmer's nightmare and has only relatively recently been solved in a satisfactory fashion.

Keyboard CPU

In Japan almost every personal computer keyboard has its own microprocessor, in effect another computer, to cope with the demands of the keyboard. A machine that is designed from the beginning to be usable in Japanese does not easily adapt to a second environment. There are exceptions like the NEC APC and the new Fujitsu which have been designed for the export market from scratch, but they are few.

Language also affects the software.

Programmers have to think in English – or a language close to it – if they are going to write satisfactory programs with most of the available computer high-level languages.

At the moment it would appear Japan is not developing any software for the international marketplace except for games which are written in assembly language. As a result many new Japanese computers have MS DOS as an operating system so that they can accept the wide range of programs written for the IBM PC.

The second reason is that computer development requires what de Bono describes as "lateral thinking".

The Japanese style of education does not appear to encourage individual thinking in this way. (It is interesting to note that Japan's great individualist, Sochiro Honda, who founded the Honda empire, had little formal education).

Dominating segments

This does not mean that Japan cannot corner certain segments of the computer market. It already dominates printers, and looks set fair to take over in floppy disk drives and memory.

Here they have done what the Japanese have always excelled at. Taken a good idea and improved on it.

In dot matrix printers, the world market is totally dominated by two Japanese companies, C. Itoh and Epson. Their products often appear under other names.

An Apple ImageWriter will say Apple on the cover but it will be C. Itoh underneath. The same is true of dozens of others. Badge engineering.

These dot matrix printers are reliable, cheap – and very noisy.

Their day may soon be over because of new technology. And again it is a Japanese enhancement of an idea that originated elsewhere.

The first commercial laser printers came from Xerox in Palo Alto, California and they were not cheap.

In Japan, Canon has now developed its own laser printer, which will be released by Apple in January.

C. Itoh and Epson both have laser printers just due for release. All of these printers will be priced around $6,500-$7,000, but this price will obviously come down as volume and competition increase.

The laser printer produces letter quality typing as good as any daisy wheel – and is much faster and quieter. As a result, within a relatively few years the daisy wheel printer will have gone the way of the dinosaur.

Apple laser

The Apple printer, from all the information which has leaked from Cupertino, produces type of a standard as good as any commercial typesetter. If this is true, and I have strong reason to suppose that it is, we will see the Macintosh and the Lisa operating as substitutes for typesetting machines in the very near future.

In disk drives the Japanese seem to have side-stepped Winchester hard disk technology and have, instead, concentrated on floppies and laser/optical technology.

Sony have already made major inroads with their 3.5 inch microfloppy, which is now standard on the Apple Mac and Lisa, some of the Hewlett Packard range, the Apricot and several others. In its double sided, double density mode it can hold well over half a Megabyte of information.

While I was in Tokyo I saw two new disk drives which are revolutionary.

The first was an 8 inch floppy disk drive from Hitachi with over 6 Megabytes of formatted memory available on each disk. Price of the drive with controller will be around $1,800, and Hitachi is offering it to other manufacturers. It will undoubtedly make a major dent in the Winchester hard disk market and it may, with the laser disk, eventually make the Winchester drive redundant.

The second drive was a modification of the Sony Walkman optical disk player. This uses a 5.25 inch disk and laser technology. More about this drive elsewhere.

Low prices

Once production is ramped – a new piece of computerese – to full output, then prices for the drive will be well under $1,000 and the price for the blank disks should be under $10. At the moment you cannot erase and write over on these disks, but with that sort of memory who really cares?

What we are, in effect, moving to is unlimited memory for personal computers, where the term Gigabyte will be as freely used as Megabytes are today.

Screens

In screens Japan is also moving ahead – but in fits and jerks.

Seiko has just released a colour Liquid Crystal Display screen which works on the same principle and just as badly as the standard black and white LCD screen.

I cannot see the Liquid Crystal Display Screen ever being a serious contender, and I am fairly certain that Apple will not release the IIc with an LCD screen as promised. Instead they will wait and use electroluminescence.

There are already several flat screens available in Japan on an experimental basis, which either work through electroluminescence or through bending the picture waves around a corner using a magnet. I tested some and they left LCD technology for dead. ☐

New campaign against fake Apples

by Gareth Powell

Apple's distributors in Hong Kong, Gilmans, in cooperation with Apple Computer Corporation of California, have initiated legal action against fake Apple manufacturers and suppliers.

Although there have been several such actions in the past, this marks the start of a determined effort to stem the flow of fake Apples from Hong Kong.

It may be that this action will be too little and too late.

Too late, because in this month's edition of "Enterprise", the export publication of the Trade Development Council, there is an article describing Hong Kong's burgeoning computer industry in glowing terms, preceded by an advertisement for a machine which it is announced is, among other things, Apple DOS compatible.

The Trade Development Council, which is a quasi Government body, takes the attitude that they will not knowingly accept advertisements for machines that are known to be in breach of patent or copyright. In this particular case, the manufacturer states that the machine does not breach Apple's copyright or patents, and the TDC will continue to run this, and similar advertisements, until it is shown to them by Apple or their solicitors that the computer concerned does involve a breach of copyright or patent.

Too little, because there are at least twelve major assemblers of fake Apples in Hong Kong – and undoubtedly a whole cottage industry of minor assemblers – and prosecuting them all will be a major task, no matter how much manpower and money Apple devote to the job.

Retarded action

Too late, because for such actions to have been totally successful, action should have been taken at least five years ago, when the then distributor of Apples in Hong Kong, Delta, supplied Apple headquarters in the United States with a fully documented and detailed study of the manufacture of fake Apples in Taiwan and Hong Kong.

There is now irrefutable evidence that fake Apples are being assembled in the People's Republic of China. Fake Apples have been seen in use in Beijing. Interestingly, most of the machines seen in the PRC have been "Wombats", the machine that was the subject of legal action in Australia against their distributor here, "Computer Edge" of Melbourne, Victoria.

There is no doubt that the sales potential of the People's Republic of China has overwhelming attractions for the Hong Kong manufacturers and assemblers of fake Apples.

Within the PRC there are few enough patent and copyright laws to make successful legal action, at best, debatable.

What are the possibilities of legal action in Hong Kong being successful?

The situation is complicated by the fact that breaches of copyright are not restricted to just the Apple itself, but also concern almost every piece of software written for the machine and also all the manuals. These are, in the main, printed in Taiwan where no copyright law exists.

Substantial action

The amount of legal action that would have to be taken by the Hong Kong Customs and Excise department to attack all of these problems would be of major dimensions.

That such action can be taken successfully is shown by the fact that persistent breaches of copyright in books is, in the main, confined to computer manuals.

Jon Covington, International Markets Manager for Apple Computer, who was recently in Hong Kong, said:

"You have to understand that Apple has only been a publicly held company for four years. And certain problems have priority...

"Apple are far behind with the production of the Apple IIe, and they are barely able to keep up with demand for the Apple IIc. The production of the Macintosh has been behind and Lisa has been so far behind that we just can't catch up.

"With so many problems in meeting the demands of the domestic market, there was a natural tendency to say:

"Why worry about China?

"Why worry about Taiwan?

"Why worry about the whole Far East?

"With over 200,000 units a month punching out in the United States why worry about what they are selling over there?'

"We are now actively attending to the problems out here and we've got some successes. They used to manufacture 100,000 fake Apple IIs in Taiwan, now it's down to 30,000.

"As the prices come down through market pressures, the margins on fake Apples get smaller. And as the distribution channels for genuine Apples become more efficient people move to the real product.

"The demand is no longer as high for the fakes. People who start using the fake machine find out that it is not reliable. They have to dump it or else they have to buy two machines. It is actually cheaper for them to buy the real product than to keep the fakes up and running.

"That's why the Hong Kong government standardised on genuine Apples for education this year. It was just cheaper in terms of better reliability and more support. They couldn't afford to have fakes."

Chinese Apple

Apple are also planning to combat the fake Apple in another way. By producing a purely Asian Apple which will be manufactured and assembled partially in Hong Kong or Singapore and partially in the People's Republic of China.

Jon Covington said "That is my plan. To have a truly Chinese Apple II+ or an Apple IIe that cannot be re-exported to another country."

Some months ago, John Cavalier, a vice president in the same department who has since left Apple, said that the cost of manufacturing such a machine could be less than US$250.

Jon Covington was not able to give any firm indication of the date when such a model might be released, but he said that the development of such a machine was a major part of Apple's plan to kill off fake Apples. By depriving the manufacturers of the potential of the biggest market of them all, it was hoped that they would fold their tents and sneak away.

One problem that still has to be solved is the production of acceptable Chinese characters by the computer. Locally made boards do produce such characters, but they are not of an acceptable standard.

Apple is currently in the middle of converting its Macintosh to produce 3,000 hiragana, katekana and kanji characters for the Japanese market, and it is probable that a modification of that program could be used on the projected Chinese Apple.

Apple Computer is now firing these opening salvos in a new and major battle against the fake Apple manufacturers and distributors of Hong Kong. It may be that the day of the fake Apple is nearly over. Maybe. □

Meanwhile in Singapore they have just produced their very own first personal computer. Called the Cubic 99, it is produced by Creative Technology, a company established in 1981.

The machine runs on CP/M, which may be thought old hat by some but still offers one of the widest selections of programs in the world. The computer has a standard memory of 64K Random Access Memory, which can be extended.

The keyboard has its own microprocessor following after the style of Cromemco with their 3000. Most interestingly, Cubic 99 will talk in English and Mandarin, two of the official languages of Singapore (Bahasa Melayu is the third). Mandarin is the official language throughout the People's Republic of China, which opens up some interesting possibilities.

Currently in the PRC there appear to be two separate streams of action. Firstly, there is the continued importation of fake Apples from Hong Kong. In fact there is considerable evidence to suggest that the machines are now being assembled in the Shum Zen bordering industrial area as Hong Kong entrepreneurs find the rest of the world's markets slowly being closed to them through legal action.

Secondly the legitimate manufacturers are trying their damnedest to corner what is potentially the biggest personal computer market in the world.

NEC seem to have exchanged contracts to manufacture personal computers in the PRC. In this race it would appear that all Japanese companies have a head start. In the first place they are used to producing machines which cater to the idiosyncracies of a language based on ideograms rather than alphabet letters.

Secondly, the other potential competitor, the United States, is hamstrung because permission has to be obtained from the government before exporting any high tech equipment to the PRC – and such permission is a long time acoming. Interestingly, Sperry made its first move into China in cooperation with two Japanese affiliates, Nippon Univac Kaisha and Oki Univac Kaisha.

It would be a fair bet that if, for example, Apple were to move into the PRC mob-handed in order to try to stem the flow of illegal copies, it would do it in association with Sony with which it has a long standing relationship.

□

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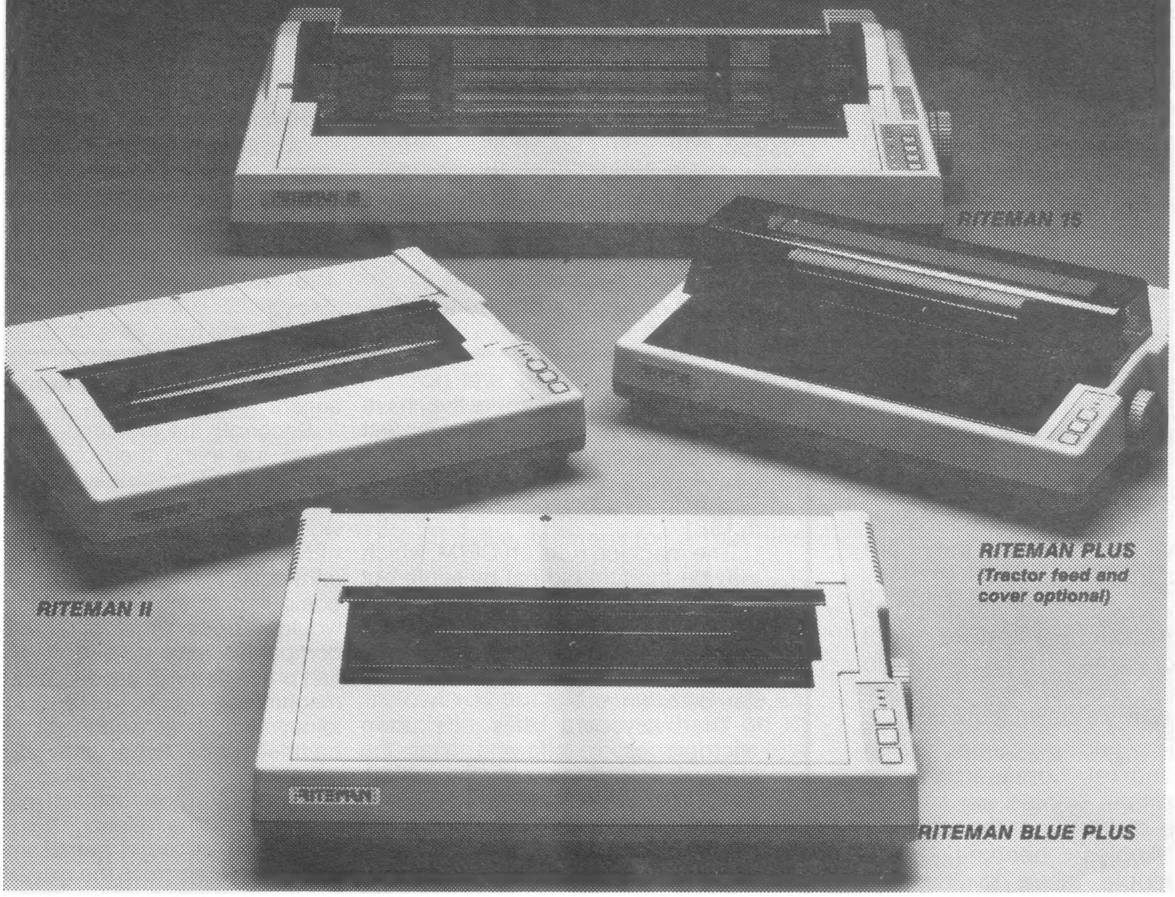

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Revolution in disk drives

by Gareth Powell

The greatest revolution since the Apple has just been exhibited in Japan.

In Tokyo I attended a demonstration of a disk drive attached to an Apple IIe which gives, hold your breath, 220 Megabytes and costs less than $400.

If you are stunned at that piece of news, you should have been there when it was demonstrated. Hardened journalists falling around all over the place.

Some historical background is in order.

The first true personal computer was not the Apple, despite what the publicity says. It was the "Altair", which was offered as a happy home soldering kit and had no storage capabilities, no keyboard, and minimal memory.

You entered a program by laboriously operating a set of switches. As soon as you switched off the machine you lost the program. Something less than satisfactory.

Hackers almost immediately started to look for a better system, and hit on the idea of saving their programs on paper tapes via a teletype machine. This saved the program as a series of punched holes on a long paper tape. (Interestingly, this was the technique that Jacquard had used to program his looms, arguably one of the ancestors of the computer.)

There was a double advantage in using this method.

Cheap and reliable

Firstly, paper tape is cheap and secondhand teletype machines are not overly expensive.

Secondly, the teletype machines could themselves be used as a keyboard to enter information into the Altair, a great improvement on working a series of switches.

It is a very slow process reading information from a paper tape, albeit much better than losing the program altogether, and hackers were soon on the lookout for a faster method.

They found it in the sound cassette system that had been developed by Philips of Eindhoven. This system is now the standard for sound cassettes throughout the world and is also an extremely cheap, if sometimes inconvenient, way of saving information and programs from a computer.

This technology is far from dead. Indeed, until relatively recently the cassette tape was the most popular way of preserving programs and data in Australia.

Tape has one big flaw.

Everything is stored sequentially and can only be accessed sequentially.

If you ask your Apple to load a particular program or file from a cassette it starts from the beginning and goes methodically through until it finds it.

You can speed up the process by keeping a very careful note of exactly where on the tape you have stored information as shown by the tape counter. However, these devices are notoriously unreliable and you need to leave a lot of room for error. Nevertheless, the cassette recorder method of storing information is still widely used.

Apple drive

Shortly after the Apple II was released one of the original designers, Steve Wozniak, decided that a disk drive was essential.

According to legend he designed a disk controller for the Apple between Christmas Day and New Year's Day in 1977. The disk system was launched in 1978, and within three months Apple was the world's largest producer of 5.25 inch (13.2 cm) floppy disk drives.

This disk drive became the de facto standard for all personal computers.

The way in which it operates is not unlike a cassette recorder. But instead of the recording medium being a long string of coated tape, it is a flat disk. This is made of a plastic called Mylar and coated with ferrous oxide (rust by another name.)

The reading/recording head travels in a straight line from the perimeter of the spinning disk to the centre and as a result can move almost instantaneously to any point of the disk where information is stored. This means an immense saving in the time taken to retrieve programs and files.

Last year a challenger to this size of disk drive appeared from Hitachi. This operated on basically the same system but with a drive using a 7.5 cm (3 in) disk. Shortly afterwards Sony introduced a drive with a 8.8 cm (3.5 in) disk of similar design. It was the size selected by Sony that became the new industry standard.

Apple and Sony

And Apple decided to use the Sony disk drive in the Macintosh and the Lisa. They settled on the single sided model, although there is a double sided model that allows the storage of an unbelievable three-quarters of a Megabyte on one disk.

Making disks for these new micro floppy drives is not easy, and there are a few horror stories around about disks wearing out prematurely or losing data when treated with nothing more than a cross look.

Everyone in the industry leaps around and says that this is simply not so. As far as I am concerned it is a case of the Emperor wearing no clothes. The sooner everyone is alerted to the fact that the expected life of these microfloppy disks is about half that of normal disks, the happier I will be.

The big advantage of these new disks is that they are encased in rigid plastic and are far less susceptible to accidental damage than the normal floppies.

The reason why it is so difficult to make a totally error free disk in this size lies in trying to cram as much as three times the amount of information onto a disk which has a recording area of less than half the standard 5.25 in. disk.

There is news that in England Sir Clive Sinclair, who makes computers like the Spectrum at the el cheapo end of the market, is about to launch a 2 in. (5 cm) disk drive. The mind boggles.

Winchester hard disks

In the commercial market the drive of preference is called a Winchester, for reasons which have never been explained to my satisfaction.

This drive contains a metal disk coated with metal oxide but, unlike all other disk drives, the read/record head never touches the surface of the disk but flies just above on a thin layer of air. If it does land on the disk this is called a "head crash" and causes sadness and grief for all concerned.

These drives typically hold 5, 10, or 20 Megabytes of memory, enough to run a medium sized company. They are not cheap, although the price has been dropping dramatically of late. For some time now there have been forecasts that the price would come down to somewhere around $200 a Megabyte.

The greatest advantage of these drives is not just that they hold a large quantity of material. It lies in the speed of access to a particular piece of information. It is much, much faster than a floppy disk.

Progress in computers does not go in a steady, smooth upward curve. It is more a series of plateaus and peaks.

Now a new peak has arrived in disk drives.

Some years ago Sony introduced their "Walkman", which fitted a lightweight pair of earphones to a cassette recorder so that you could make yourself deaf whilst on the move. It sold hundreds of thousands throughout the world.

Walkman records

Since then Sony have been working on a way to allow the Walkman idea to be extended to records. You may think this is a daft idea. I would not disagree with you.

Sony have now solved the technical problems and released an optical/laser record player which uses 5.25 in. (13.2 cm) disks and can operate while bouncing against a hip while the user walks along. Interesting but hardly significant.

What is significant is that tied to a computer this record player makes the most amazing disk drive in the world.

A disk drive which will revolutionise the way we use personal computers and the way they are sold and the markets to which they are directed.

The reasons are cost and capacity.

Cost first.

The machine as a record player will be selling for something under $400 and recorded disks will be around $15 each, blank disks around half the price. Which is about the equivalent of the cheapest disk drive that you can currently obtain.

Undoubtedly, converted to personal computer use it will cost more – much more in the beginning. But competition will drive that price down to the same price as the record player version within months rather than years.

Now capacity.

220 Megabytes

Each disk will hold 220 Megabytes of information. Which is 800 times more than the normal floppy disk and ten times more than most Winchester hard disk drives.

That is more memory than you are going to use in three years of fairly steady use. And when you have filled a disk you merely insert another.

This means that we will soon be freed for ever from loading disks, whether for recording or program use. It will be possible to buy a disk with all the programs you will ever need already recorded. And use the rest of the immense space available for your own purposes.

Why do I think this drive is so revolutionary?

Because it will inevitably and dramatically change the way that we use personal computers.

It will be simple for disks to be made which will be an extensive library of information. When you buy these disks you will probably buy an update service so that your disks are replaced yearly or monthly or even weekly. The cost will not be prohibitive.

The basic cost of the disks is so low and the capacity so great it will be possible to have a complete business information system, or a complete university education available on a series of disks for your own personal computer.

Ready next year

When will this all happen?

The best indication I have been able to obtain is that the Sony system as disk drives will be available towards the middle of next year. Once they are available in any quantity they will undoubtedly make all other type of disk drives almost totally redundant.

There will probably be a lot of industry pressure to keep the price of these new drives in reasonable relation to the prices for normal drives. The success of such a move must be relatively short-lived, because the name of the game for Japanese manufacturers is quantity.

I cannot overstress how revolutionary this new disk drive technology is. It will give a massive boost to the integration of computers into the way we live.

I will lay fairly substantial odds that we will see it first in the Macintosh and then in all Apple machines. ☐

A side view of "OverVue"

by Gareth Powell

Greg Lister, the thin ex-Thespian of Software Source, was enthusing about "OverVUE".

"Now is the winter of our discontent made glorious summer by this Apple work."

Most impressive he was too.

"OverVUE" is an information manager, and the producers, yclept ProVUE Development Corporation, have assiduously avoided proclaiming it a database. Which is a good thing.

In calling it an information manager they tell the literal truth.

Using it with a Macintosh which has the full memory is easy, elegant and useful (after having had my Mac upgraded, there is no way in the world I could face using the original slim line memory model).

For reasons which are probably obvious to Americans but not to me, the first example given for using this information manager is a telephone bill. It may be that in the United States, telephone bills are whistled into your computer via the modem. That is not yet the case in Australia.

Because of limitations of size, the telephone bill sample will not all fit into the Macintosh screen at the same time. With your mouse in your hand, however, you can scroll rapidly to any part of the document.

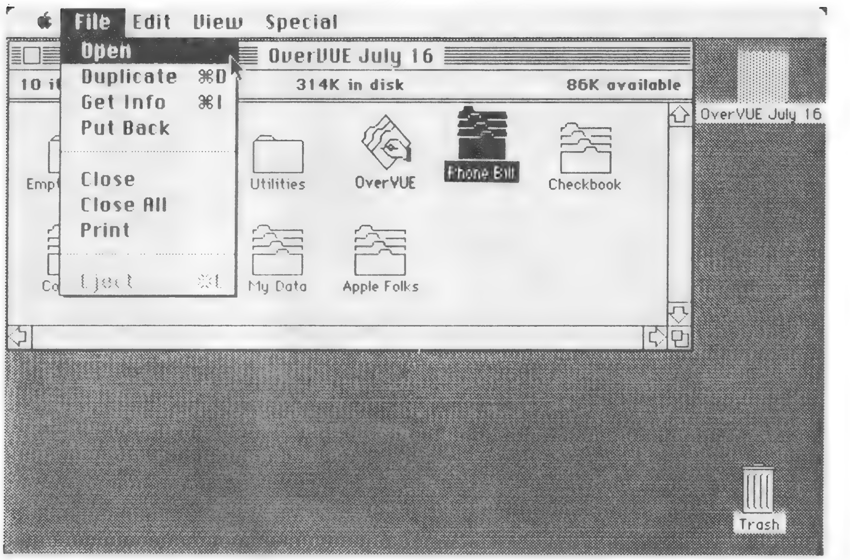
Unideal example

I am not persuaded that the telephone bill was the ideal list of information to use as an example, perhaps preferring a list of the names and addresses of nubile and available young ladies.

However, it does allow you to use and become familiar with the features of "OverVUE".

The first feature is "Sort".

You slide the cursor to the top of the column you want sorted. You drag down the menu which is under "Analyze".



If you want to sort in the traditional alphabetical way you select "Sort Up" and in seconds the sort is done. I do not know what sort algorithm lurks inside OverVUE. Whatever it is, it is unbelievably fast. Don't blink your eyes when you are doing a sort or you will miss all the action.

Perhaps for perverse reasons you would like the sort back to front? After all, this is Australia, where everything is upside down which is difficult for business but great for sex.

To do that, select "Sort down" and, indeed, Zacharias tops the list.

Numerical sort

The numerical sort facility operates on much the same basis. You can either list with the largest number at the head or with the smallest number, ending with the largest.

There is also a "Find" facility which allows you to group together all entries using a particular word. In the sample they give, it is telephone calls to Boulder.

I don't know about you, but telephoning Boulder is not high on my list of activities this year. But the central idea is there. If you have a large list of information you can manipulate it in almost any way you wish – with the greatest of ease.

Once you have gone through this exercise a few times, which because it is so enjoyable you will find yourself doing, you can then print out.

Here the book of instructions (an admirable, clear and concise tome) presents words of great truth and import.

"Since the age of the totally electronic office has not arrived yet, it is still necessary to convert your data sheet from the electronic impulses to paper and ink."

Never has a truer word been spoken. The day of the paperless office will arrive on the same day as the paperless lavatory.

Setting up

The book of instructions then moves on to show you what you can do with "OverVUE" using a modicum of intelligence.

You can set up your data file in columns and give exclusive attributes to each of those columns. For example if you are going to list dollars and cents in one column, you can drag down a menu and select "Money" and "Flush right" which puts all the decimal points in a neat array.

Once you have sorted out the way you want your data sheet to look you are not, as it were, locked into stone. You can always edit the format by deleting columns, inserting columns, switching columns around and changing headings. In fact, total flexibility.

The data can, of course, be edited in any way you like.

One of the better grace notes of this program shows that the programmer has actually been involved in making data lists. By a stroke of one key you can duplicate any entry as many times as you like. This facility is called "Ditto" and it is worth its weight in gold.

As with all Macintosh programs, the options available are listed across the top of the screen. The Apple sign is to the far left. A quick click with the mouse button with the arrow on the Apple brings up a screenful of useful information about the data you have entered.

For example it tells the total number of records entered and the percentage of memory that has been used, as well as letting you know how many characters are available for expansion of the data sheet.

Simulated data base

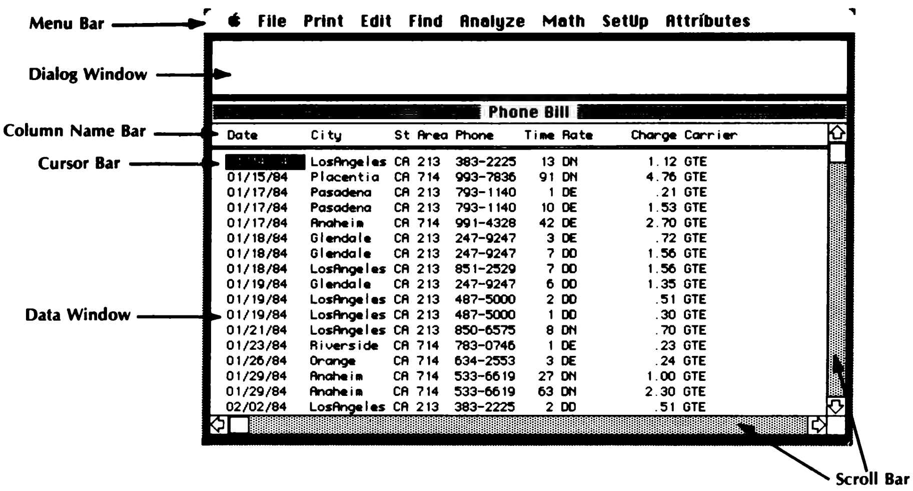
When it comes to sorting, selecting and searching "OverVUE" emulates a relational database with an immense amount of low cunning.

Let us suppose you have a list of one thousand customers in Australia. You want a list of all those customers who have spent more than $1,000 in the past year, who are based in Victoria and who have ordered in the past few months. And let us presume all this relevant information is available in columns within the data sheet.

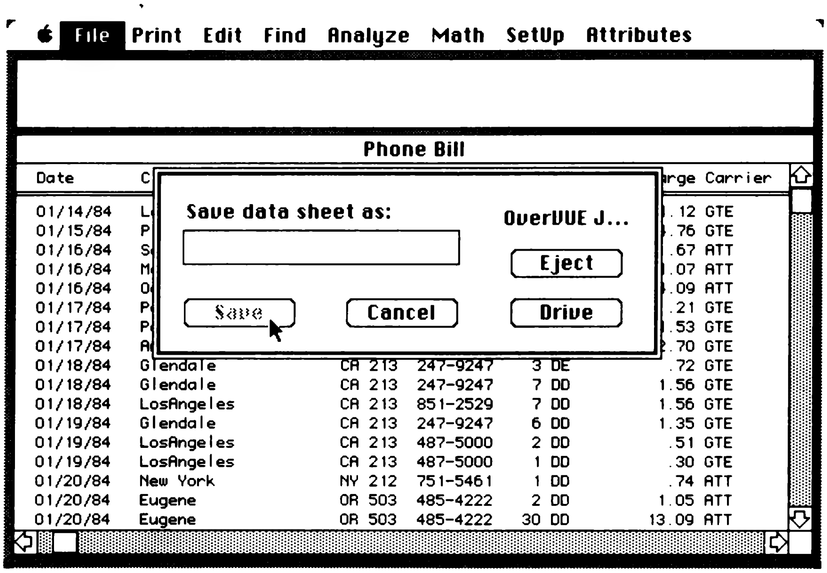
With a true relational data base you would do that in one fell swoop, setting out the parameters and getting an immediate answer.

But "OverVUE" is not a true relational data base. It doesn't pretend to be. But it can still handle this sort of problem with great facility.

First you do a "sort" over the States column, selecting only Victoria. Then you go over amounts spent in the past year asking for everything over $1,000. Finally, you automatically select those who have ordered in the prior five months.



```
Date       City        St Area Phone     Time Rate    Charge Carrier
[illegible] LosAngeles CA 213  383-2225   13 DN        1.12 GTE
01/15/84   Placentia   CA 714  993-7836   91 DN        4.76 GTE
01/17/84   Pasadena    CA 213  793-1140    1 DE         .21 GTE
01/17/84   Pasadena    CA 213  793-1140   10 DE        1.53 GTE
01/17/84   Anaheim     CA 714  991-4328   42 DE        2.70 GTE
01/18/84   Glendale    CA 213  247-9247    3 DE         .72 GTE
01/18/84   Glendale    CA 213  247-9247    7 DD        1.56 GTE
01/18/84   LosAngeles  CA 213  851-2529    7 DD        1.56 GTE
01/19/84   Glendale    CA 213  247-9247    6 DD        1.35 GTE
01/19/84   LosAngeles  CA 213  487-5000    2 DD         .51 GTE
01/19/84   LosAngeles  CA 213  487-5000    1 DD         .30 GTE
01/21/84   LosAngeles  CA 213  850-6575    8 DN         .70 GTE
01/23/84   Riverside   CA 714  783-0746    1 DE         .23 GTE
01/26/84   Orange      CA 714  634-2553    3 DE         .24 GTE
01/29/84   Anaheim     CA 714  533-6619   27 DN        1.00 GTE
01/29/84   Anaheim     CA 714  533-6619   63 DN        2.30 GTE
02/02/84   LosAngeles  CA 213  383-2225    2 DD         .51 GTE
```



```
Date       C                                            rge Carrier
01/14/84   L                                            .12 GTE
01/15/84   P                                            .76 GTE
01/16/84   S                                            .67 ATT
01/16/84   M                                            .07 ATT
01/16/84   O                                            .09 ATT
01/17/84   P                                            .21 GTE
01/17/84   P                                            .53 GTE
01/17/84   A                                            .70 GTE
01/18/84   Glendale         CA 213  247-9247    3 DE     .72 GTE
01/18/84   Glendale         CA 213  247-9247    7 DD    1.56 GTE
01/18/84   LosAngeles       CA 213  851-2529    7 DD    1.56 GTE
01/19/84   Glendale         CA 213  247-9247    6 DD    1.35 GTE
01/19/84   LosAngeles       CA 213  487-5000    2 DD     .51 GTE
01/19/84   LosAngeles       CA 213  487-5000    1 DD     .30 GTE
01/20/84   New York         NY 212  751-5461    1 DD     .74 ATT
01/20/84   Eugene           OR 503  485-4222    2 DD    1.05 ATT
01/20/84   Eugene           OR 503  485-4222   30 DD   13.09 ATT
```

OK, it is a three step job. But because the sort algorithm is so fast the job breaks down to find, click, pause, find, click, pause, find, click, pause and there is your answer.

Nothing is mnore calculated to show the power of the 32 bit microprocessor in the Macintosh than a program like this.

Mathematics

Is this all?

Certainly not.

Built in to "OverVUE" is a mathematical facility. It can give you totals, sub totals, running totals, the number of cells entered, averages, minimums and maximums. It will also multiply, divide, subtract and add and it will do these between columns.

True, the program will not perform quadratic equations. Nor yet multiple regression analysis. But for expense accounts, balancing cheque books and keeping simple records it has few equals.

"OverVUE" is another Macintosh

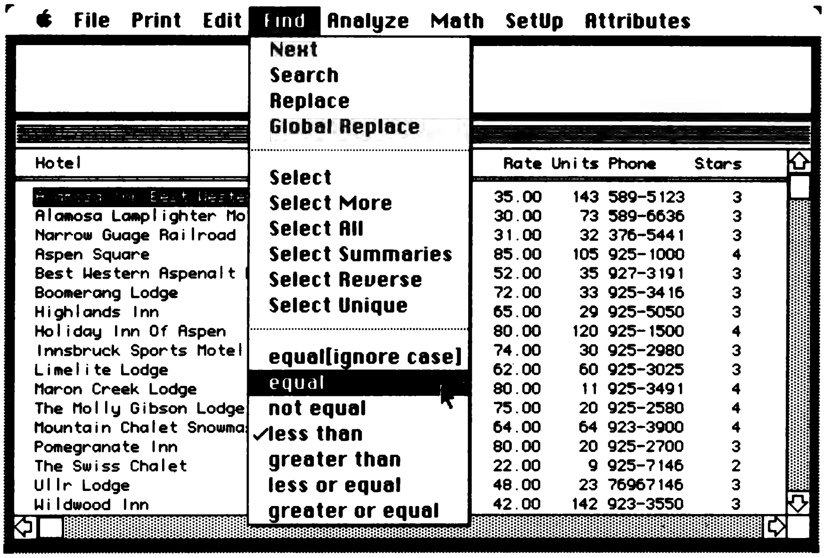
program which shows quite distinctly it has been written specifically for the Macintosh and is not just a modification of an existing program.

Every new program like "OverVUE" that comes on the market serves to strengthen the Macintosh's claim to being a serious computer for the serious user.

One last point. You are positively encouraged to make back-up programs of "OverVUE". Would that other software houses were as enlightened.

Available from Software Source Pty Ltd (02) 389 6388.

□



Hotel	Rate	Units	Phone	Stars
[illegible]	35.00	143	589-5123	3
Alamosa Lamplighter Mo	30.00	73	589-6636	3
Narrow Guage Railroad	31.00	32	376-5441	3
Aspen Square	85.00	105	925-1000	4
Best Western Aspenalt	52.00	35	927-3191	3
Boomerang Lodge	72.00	33	925-3416	3
Highlands Inn	65.00	29	925-5050	3
Holiday Inn Of Aspen	80.00	120	925-1500	4
Innsbruck Sports Motel	74.00	30	925-2980	3
Limelite Lodge	62.00	60	925-3025	3
Maron Creek Lodge	80.00	11	925-3491	4
The Molly Gibson Lodge	75.00	20	925-2580	4
Mountain Chalet Snowma	64.00	64	923-3900	4
Pomegranate Inn	80.00	20	925-2700	3
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The Macintosh Saga Continues

Main Street Filer

Barry Kauler shows how to make office or home filing easier.

Database programs are those designed for storage on magnetic disk, of large amounts of data, such as customer records or stock lists. Having disks as a medium instead of paper gives a great number of advantages, such as compact and tidy storage, easy and quick access of any information, and immediate updating. Time is saved: for example should an educational establishment want to send a letter to all students studying in a particular course, the database program can search through the records, find them, and if required print out mailing labels. Apple's Macintosh is a new breed of microcomputer, that has spawned a new generation of graphics-intensive and easy-to-use software. The following comment may astonish you, but it's quite appropriate: my initial criterion for assessing Macintosh software is, can I use it without referring to the manual? I found that with some of the best Mac software the answer is yes. For example, only today I obtained MacProject, a resource & time scheduling program for project managers, minus a manual --- and I mastered it 95% in about half an hour of playing around. Ideally, a software program should be like a book --- when you buy a book, you just open it and start reading.... no problem, since you already know English. Why should you have to learn a new operating procedure each time you buy a

new program? Apple have defined Mac operating procedures to the extent that third-party software houses are constrained to follow the standard --- at least that's Apple's intention. Now, applying the above criterion to my latest acquisition, a database program called Main Street Filer.......

This article is primarily a review of a database program: Main Street Filer. If you want more information about Mac himself, there are plenty of other articles in various journals, plus 3 that I have published in issues 6, 7 & 8, 1984, of Australian Apple Review.

Applying my initial criterion for evaluating Mac software, to Main Street Filer, I rate it about 80%. That is, I rapidly picked up how to use about 80% of the program just by playing around without the manual. I was hindered somewhat by some peculiarities in the operating procedures, that did not seem to be entirely in line with the Mac procedures I'm accustomed to using. Also the sophistication of printout options baffled me, and I found it necessary to study this section in the manual quite carefully.

Now that I've had some practice and become familiar with Main Street Filer, I can conclude that it is very easy to use. I only needed to look in certain sections of the manual to become competent, and now I can happily use the program, probably rarely needing to refer back to the manual.

Of course, sometimes ease-of-use is obtained at the expense of sophistication, but this program is really quite a respectable performer. Let's look at some of the spec's:

> UNLIMITED FILE SPACE: Dependent on the size of the disk you use, you may design and use an unlimited number of different files. Files can be designed to contain from one to 36 fields.
>
> Note:
> A RECORD is a combination of FIELDS containing related information. One or more records make up a FILE. This terminology will be clarified as this article progresses.

RECORD SIZE: Records can hold up to about 1440 characters each. Each field title can be up to 20 characters long, and the data entered into each field can be from one to approximately 40 characters long. The maximum number of records for any file is 65000.

Now I'm not going to bore you with an endless list of specifications. You would find it more interesting I think to have a run through a typical session, that demonstrates the main features. So here goes....

Looking first at Figure One, you see what appears on the screen when Main Street Filer is first entered. The usual menu bar appears along the top, and the normal procedure would be to select one of the selections from within the **File** menu. **New** is for when you want to create a brand new file of records. **Open** is used to access an existing file. In this case I have already created a file which contains records of hypothetical students at a college, so to open up this file I need to select **Open**, as shown.

After making this selection, a window appears as shown in Figure Two, that displays all the files on disk that have been previously created by Main Street Filer, and also has the **Eject** option to get a file from another disk. In this case I have only got one file on disk, called STUDENTRECORDS.

Having opened up STUDENTRECORDS, the menu bar changes slightly. Note that in Figure Two some of the menu options appear as grey rather than black: this means that they can not currently be selected. But once I loaded STUDENTRECORDS, they became available. The options are all shown in plain English, and it's pretty obvious what they do.

Add is for adding additional records into the file, **Change/Examine** is for changing or just examining any records, or changing the file design, **Delete** is for deleting records, **Copy** is for copying records from one file to another, and **Print** is for printing out any information.

In Figure Three I have selected to change/examine the records within my file, and Figure Four shows what happens after that is done. At this point one of the advantages of Main Street Filer shows itself: the high-speed searching capability. For each file, a separate indexing file is automatically created, that stores pointers for up to four fields, and eliminates lengthy searching through the database as in some other database programs. You select which fields you want to use in this pointer file: Figure Four shows that I have chosen the fields **Name**, **Postcode**, **Subjects Current**, and **Course** from the fields used in STUDENTRECORDS. **SUB ORDER** allows selection of more fields, that will keep order within order. For example selecting **Postcode** as the primary order and **Name** as the sub order, will cause the records to be ordered by postcode, then within each postcode they'll be ordered by name.

Where the arrow is pointing in Figure Four is where I'm just about to type the postcode of the particular student record I want to find. Once that is done then clicking the mouse on **Accept** will execute the selection.

Now we go to Figure Five, where I have retrieved the information on the particular student I'm interested in. The field names appear on the left, and the entries alongside. It is easy for me now to click the mouse anywhere in this area and make changes, or if I want to scan through other records, I click on the plus or minus buttons, which will allow scanning forward or backward respectively. **Search** button is if I want to retrieve the window of Figure Four, **Add** is for adding additional records, **Delete** is for removing records from the file, **Accept** causes the record on view to be accepted into the file saved on disk, and **Cancel** cancels the current operation.

It all seems to work okay, except scrolling backwards through the records toward the beginning of file, causes a fault to occur in the program once beginning-of-file is reached. My version of Main Street Filer was 1.1, and although this works quite okay, the next version should have this and some other minor bugs worked out. I also had some problems with the selection criteria for printout of records, but I won't write specifically what the problem was, because maybe I'm just thick, and it's not the program's fault. Anyway, the Main Street company must be aware of these faults, and maybe even now there's another version on the market. The company do have a program of supplying program enhancements to registered customers, at low cost, so presumably if you bought version 1.1 now, you could obtain the next version cheaply.

I was able to add, change, examine, and delete records without any trouble, and without much referral to the manual, and you should also find it just as easy. But when it came to the **Print** menu selection, I became confused. The print options are very flexible, and seem to cover every possibility that anyone could want. Figure Six shows what happens after selecting **Columnar Report** from the **Print** menu. The selection window again appears, and you can select which record you want to have printed out, or you can just click in the **All box**, which is what I did in this example, which leads to Figure Seven. Figure Seven shows another window for further selection of records, which confused me at first. The bottom of the window shows all the fields, and you can move any one of those up into the selection region at the top of the window. In this case I just used **Name**, and specified all names starting from AAA and ending at ZZZ. Presumably this would have the effect of printing out all of my records.

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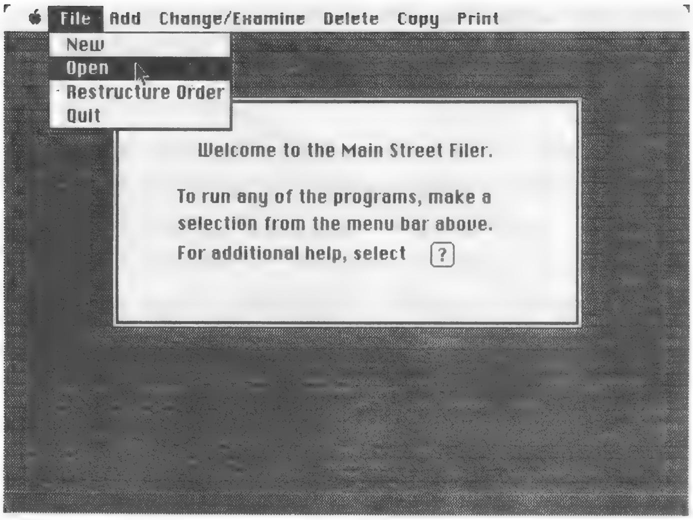
'When it matters make it Memorex'



Welcome to the Main Street Filer.

To run any of the programs, make a selection from the menu bar above. For additional help, select ?

FIGURE 1

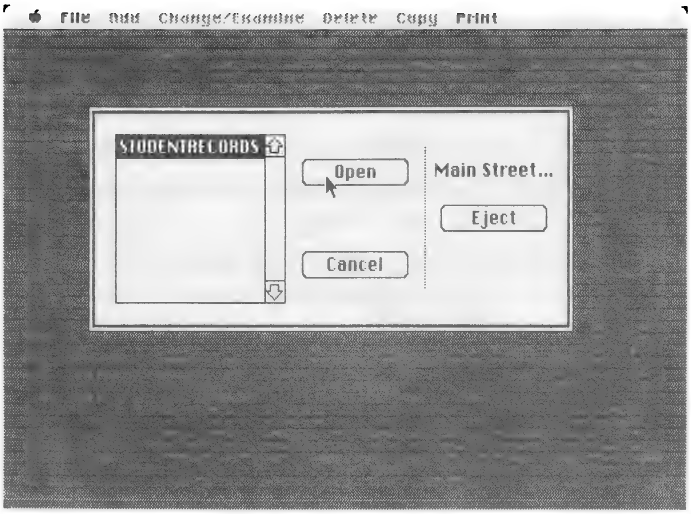


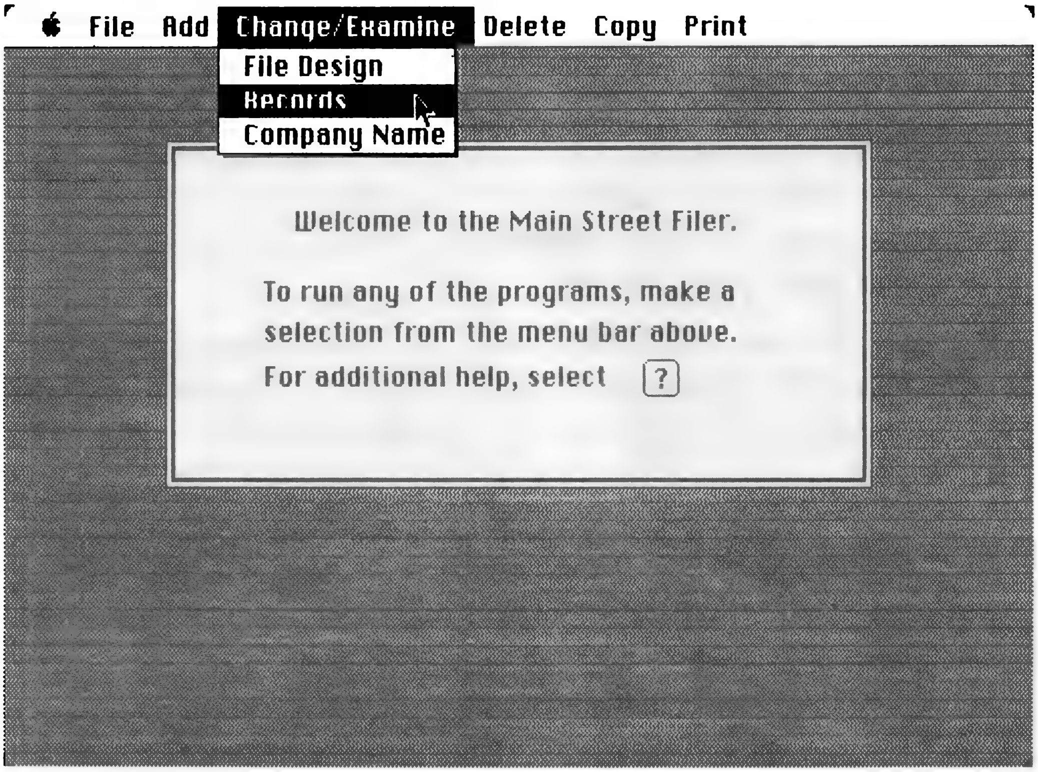
FIGURE 2

Clicking on **Accept** indicates acceptance of the entries in the window, and then Figure Eight appears, which allowed me to save the selction criteria, so I can reuse it at any time in the future. This should save a lot of time if I have to do a lot of repetition of printing.

Figure Nine is the next window, which specifies the format for the printout. Once I had done that, I clicked on **SAVE/PRINT**, which saves that format for future use, again saving time for repetitious use. Also this causes the printout to occur, but only after two more windows appear (sigh). These are shown in Figures 10 and 11, and specify further formatting and titles. Then finally comes the output of Figure 12.

So what are my overall impressions? Basically I found the program quite easy to use, unlike those in the dBase II classification that require you to learn a programming language. Yet Main Street Filer is also quite powerful. There are some others on the way for Macintosh, such as File-Vision and Helix, which make better use of graphics and icons, so I've heard, but I haven't yet got my hands on any of these. The point is, Main Street Filer is easy to use, powerful, and would quite happily handle any of the jobs that I can think of, for which I previously used dBase II. Most important I think is the special pointer file for very quick searching, and which also eliminates any need for sorting of records. The selection criteria are quite impressive, and so to are the printout options. The main negative comments are the minor bugs, and the un-Mac-like way of some of the operating procedures, which are all quirks that you can quickly adjust to. Overall it looks like a good buy, though I would prefer to see the USA price of $250 knocked down somewhat, like halved. I believe firmly that there is a threshold, below which the software will sell like hotcakes, and this optimum price is somewhere in the $50 to $150 range. I am like many others: I would like to buy lots of different software, even if it's just to experiment and play with, but the prices are too high.

I welcome any correspondence from readers, on experiences with Mac software, that I can collate and include in my articles. My postal address is C/- Collie School of Mines, Wittenoom Street, Collie, WA 6225, Australia.

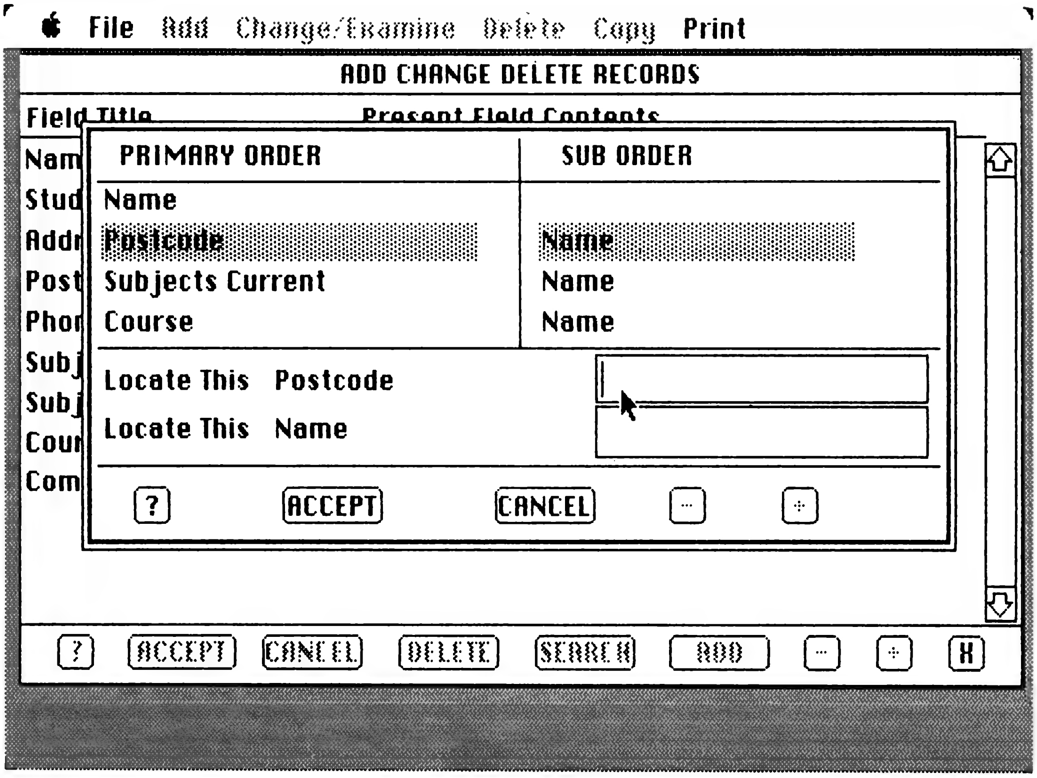


Welcome to the Main Street Filer.

To run any of the programs, make a selection from the menu bar above.

For additional help, select ?

FIGURE 3



PRIMARY ORDER	SUB ORDER
Name	
Postcode	Name
Subjects Current	Name
Course	Name

Locate This Postcode

Locate This Name

FIGURE 4

Can you be ruth and a loving paren

There are many ways for you to be more competitive in the way that you go about your business. (The faint-hearted would call some of these ploys ruthless.)

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less in business
t at the same time?

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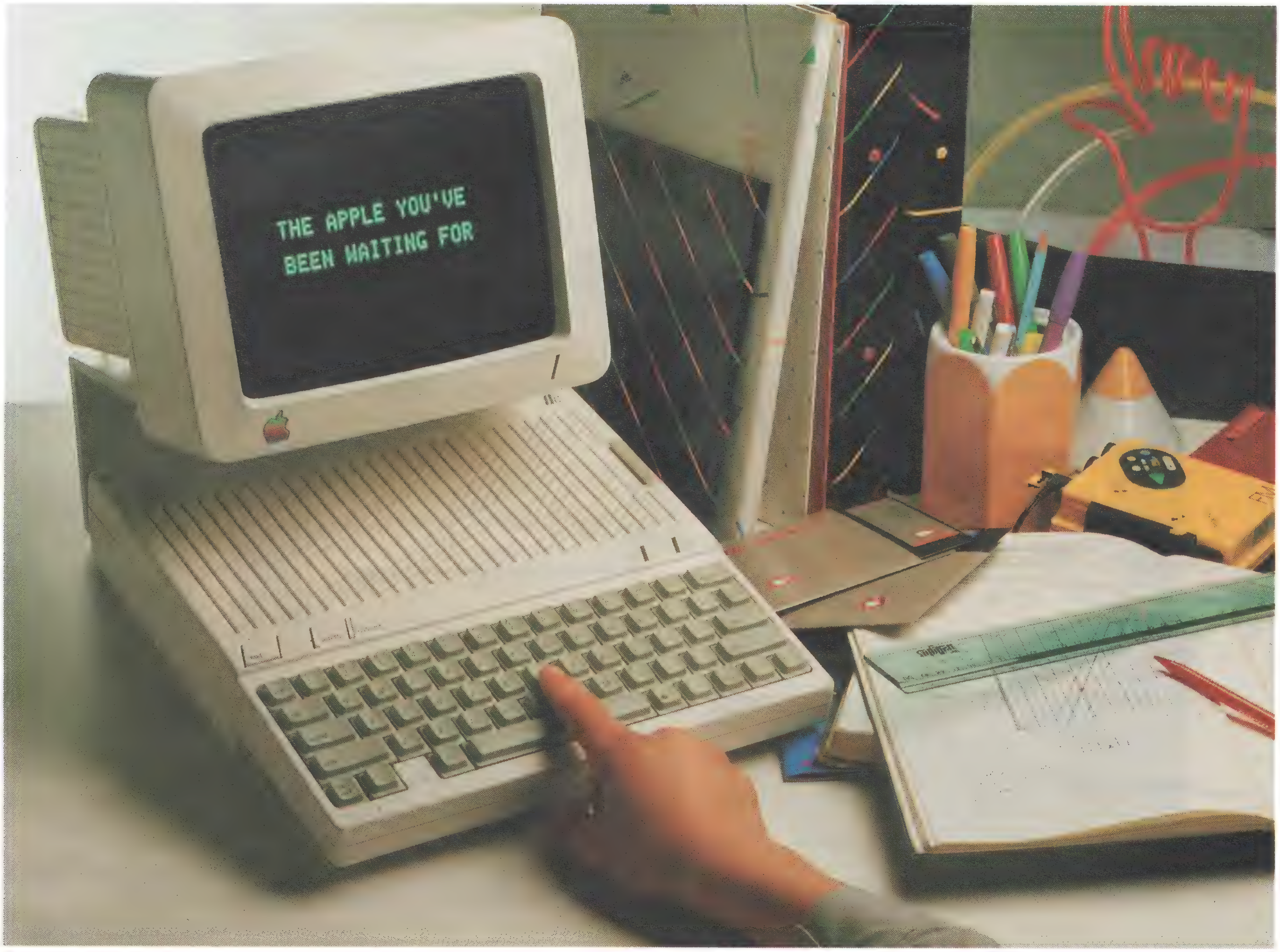
apple



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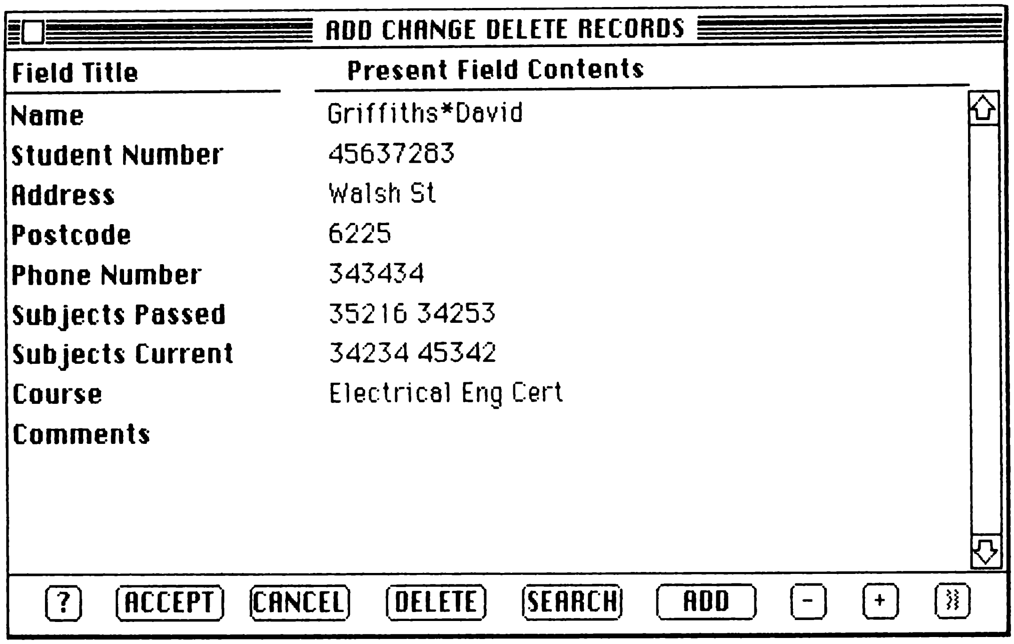
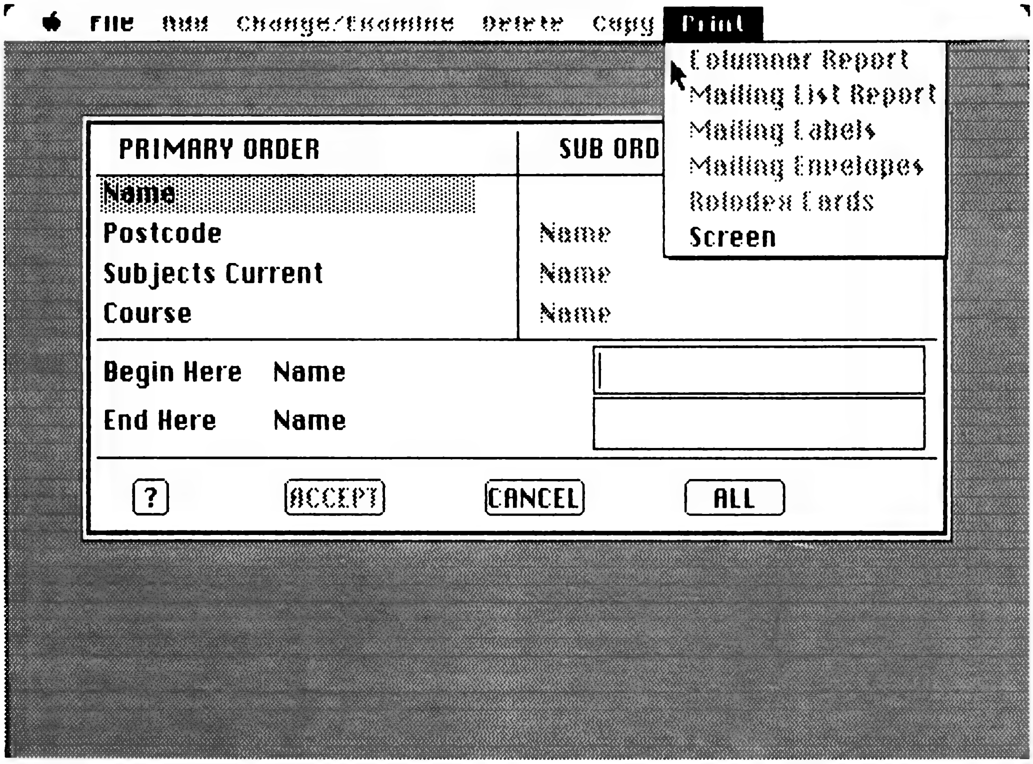


ADD CHANGE DELETE RECORDS

Field Title	Present Field Contents
Name	Griffiths*David
Student Number	45637283
Address	Walsh St
Postcode	6225
Phone Number	343434
Subjects Passed	35216 34253
Subjects Current	34234 45342
Course	Electrical Eng Cert
Comments	

FIGURE 5

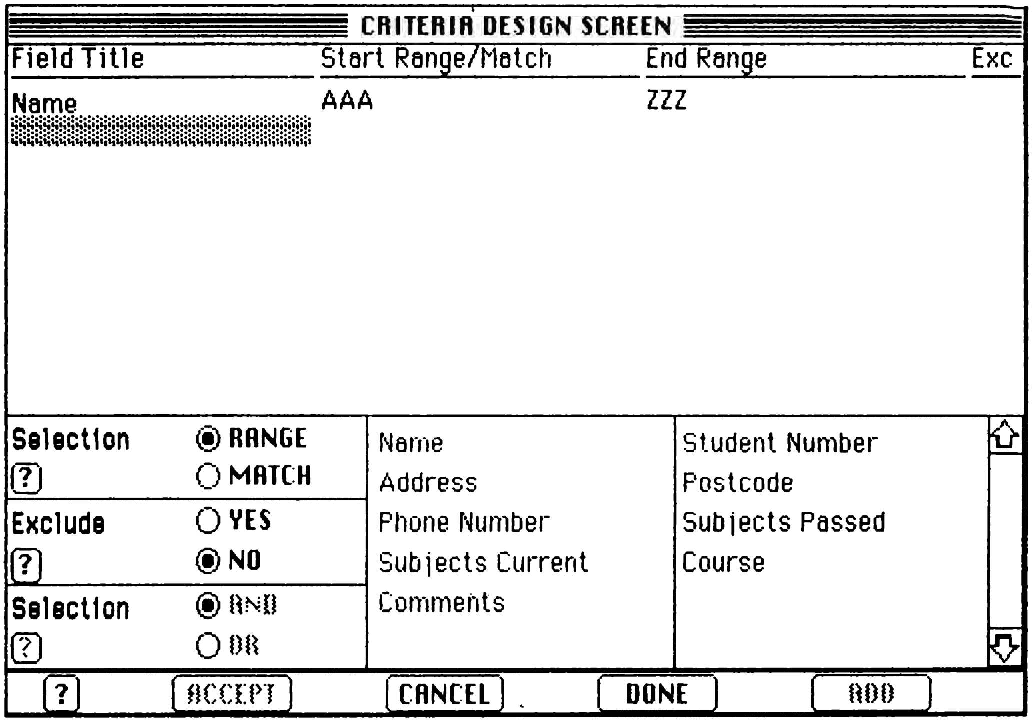


PRIMARY ORDER	SUB ORD
Name	
Postcode	Name
Subjects Current	Name
Course	Name

Begin Here Name

End Here Name

FIGURE 6



CRITERIA DESIGN SCREEN

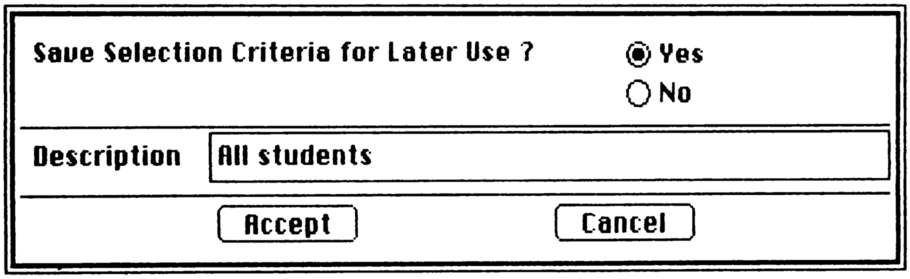
Field Title	Start Range/Match	End Range	Exc
Name	AAA	ZZZ	

Selection ● RANGE ○ MATCH

Exclude ○ YES ● NO

Selection ● AND ○ OR

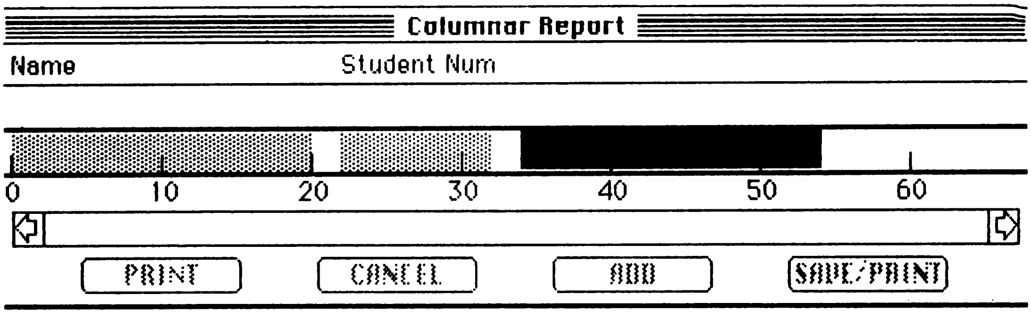
FIGURE 7



Save Selection Criteria for Later Use ? ● Yes ○ No

Description: All students

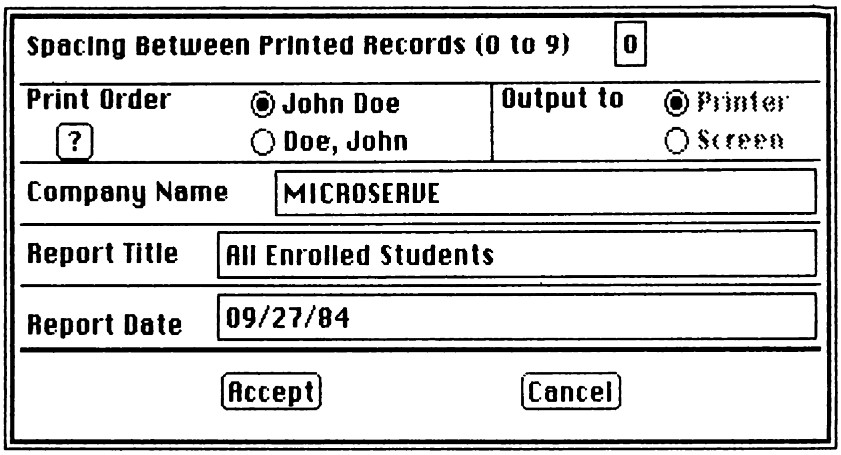
FIGURE 8



Columnar Report

Name	Student Num

FIGURE 9



Spacing Between Printed Records (0 to 9) 0

Print Order: ● John Doe ○ Doe, John

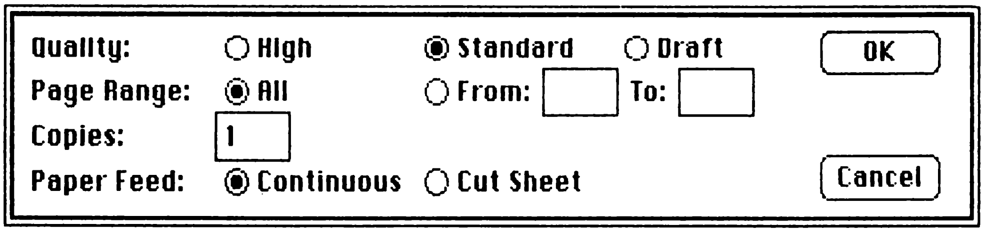
Output to: ● Printer ○ Screen

Company Name: MICROSERVE

Report Title: All Enrolled Students

Report Date: 09/27/84

FIGURE 10

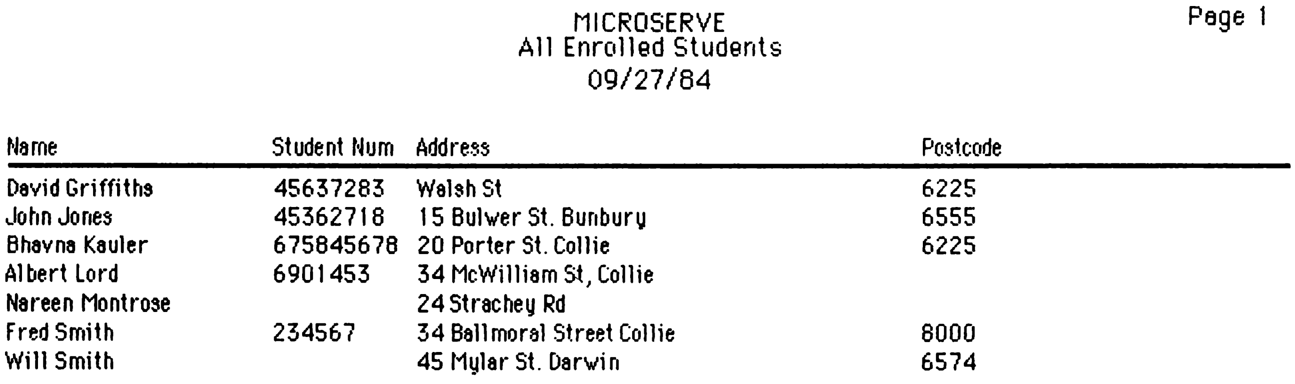


Quality: ○ High ● Standard ○ Draft

Page Range: ● All ○ From: To:

Copies: 1

Paper Feed: ● Continuous ○ Cut Sheet



MICROSERVE
All Enrolled Students
09/27/84

Page 1

Name	Student Num	Address	Postcode
David Griffiths	45637283	Walsh St	6225
John Jones	45362718	15 Bulwer St. Bunbury	6555
Bhavna Kauler	675845678	20 Porter St. Collie	6225
Albert Lord	6901453	34 McWilliam St, Collie	
Nareen Montrose		24 Strachey Rd	
Fred Smith	234567	34 Ballmoral Street Collie	8000
Will Smith		45 Mylar St. Darwin	6574

FIGURE 12

FIGURE 11

Introduction to Assembly Language Programming

by Charles R Smith

reprinted from
"THE MAPLE ORCHARD"

What is assembler and machine language?

Most of us have some familiarity with BASIC, with its English-like commands such as "PRINT", "INPUT" and "FOR .. NEXT". There are other high-level languages, like Fortran and Pascal, which similarly are formed of English-like commands. The Apple's central processing unit (CPU) cannot understand such English commands, but intead the CPU must "interpret" the commands or "translate" them into a form which it can understand.

When running a program in BASIC, the Apple takes each line of the program and interprets it into a machine language form which is acceptable to the CPU. Once interpreted, the CPU then executes the line. Applesoft is therefore called a "BASIC Interpreter" or is an "interpreted BASIC".

The opposite of the high-level, structured languages are assembler and machine language. The terms "assembly language" and "machine language" are often used interchangeably, although there is a difference. Programming in machine language is accomplished when hexadecimal or binary data is loaded into the computer byte-by-byte (eg entering the Monitor by CALL –151 and inputing "300: A9 0A ..."). When computers were in their infancy, this was the only option available. This form of programming can only be intelligible to people who think like a computer. To us lesser mortals, writing a program in machine language is the ultimate exercise in frustration.

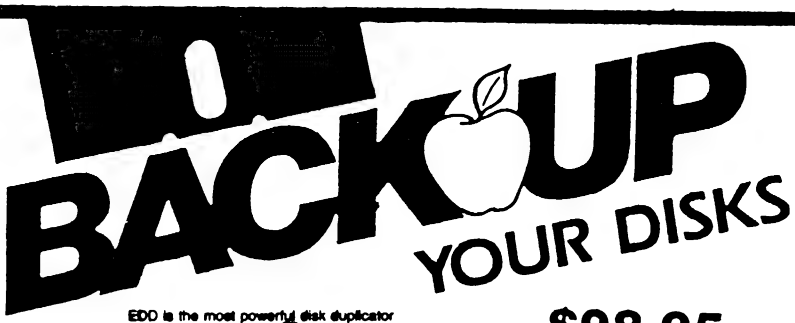
(An aside: when Steve Wozniak and Steve Jobs first built an Apple I computer, they took it to parties and entered hundreds of hex codes by hand just to load in a program to demonstrate this first Apple's ability. Allegedly, DOS was first written this way!)

Enter Assemblers. An assembler is simply a tool which allows a person to write a program using somewhat more intelligible commands, and then the assembler program converts ("assembles") the English-like commands into the corresponding machine language code.

While there is a definite and significant difference between "assembly" language and "machine" language, the two terms are often used interchangeably. Throughout this article, such interchangeability shall be used.

Why program in machine language?

If assembly language is tougher than BASIC, why bother being a glutton for punishment? Is there something to be said for such an



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arcane language? Consider these three reasons: speed, flexibility and memory management.

The most prominent benefit of a machine language program can be seen when you play a commercially-produced, arcade style game. Such games are invariably written on an assembler (the people at Southwestern Data Systems tell me that the games from Sirius are written on Merlin). The execution speed of a machine language program is much faster than a corresponding BASIC program – arcade quality games simply cannot be written in BASIC. Even BASIC which has been compiled into machine language (by Applesoft compilers such as TASC or Speedstar) is still slower and more memory-hungry than an equivalent program written in assembler.

The advantage of speed can be used in other situations which will significantly enchance the Apple's capability. Sorting, matrix operations and disk utilities are but a few reasons to use the speed of machine language.

The second reason to program in machine language is the increased flexibility which it offers. The commands in Applesoft can be enhanced by the use of short machine language routines hidden away in memory. Print formatting functions, sound generation, sorting, string handling and swapping, decimal to hex conversions, garbage collection and memory clearance, and array operations are but some of the more commonly used subroutines. While such machine language enhancements are available commercially, they can also be had at a very low cost, as they are listed in such publications as Nibble and Call-A.P.P.L.E.

The third advantage relates to memory management. Machine language programs are more efficient in their consumption of memory than are their BASIC counterparts. Because of this, it is possible to have several machine language routines residing in memory concurrently, thereby enhancing Applesoft while at the same time avoiding a significant reduction in the memory available to the user.

What is needed to get started

To begin programming in assembler/machine language, it is not necessary to purchase any software tools. A good book, however, can be invaluable. Once your interest is sparked, you may develop a sudden urge to purchase an assembler. Other machine language utilities are helpful.

There are three different levels of sophistication at which you may enter machine language programming:

1) Machine language using the Monitor

Although not the most flexible approach to machine language, this is the cheapest route to go, and it forms a good starting place. The way to begin is to exit Applesoft and get into the Monitor by means of the command:

```
]CALL-151
```

which yields the "*" prompt.

From here we can enter a program by giving the starting address and the hexadecimal data. Try the following:

From here we can enter a program by giving the starting address and the hexadecimal data. Try the following:

```
*300:AD 30 C0 88 D0 FD 4C 00 30
 <ret>
```

Where you enter the number 300, a colon, then 9 sets of hexadecimal data. Be sure that you do not leave a space between the colon and the first number. At the end of the line, enter a <carriage return>. Up to 85 hexadecimal numbers can be entered at once this way.

What this program does is toggle the speaker by addressing its memory location (AD 30 C0), counting downwards from 255 to 0 (88 D0 FD) and then jumping back to the start (4C 00 30). In other words, this short routine keeps a constant tone going on the speaker until you hit <RESET> to get out of it. To start this program once you have typed in the above line, simply go to location $300 and do what's there by the command:

```
*300G <ret>
```

You have just entered your first machine language program (this program example is by courtesy of SC Macro Assembler).

Now go on to greater things. Grab an assembly/machine language listing and enter it into your computer. If you are entering an assembly listing, you will see the hex code in the left hand columns. For example, the above program looks like:

```
0300 - AD 30 C0 1 TONE LDA $C0
  30
0303 - 88     2 LOOP DEY
0304 - D0 FD  3      BNE LOOP
0306 - 4C 00 03 4    JMP TONE
```

Remember to save your work on disk. This is done with the BSAVE command. It is necessary to specify the starting address and length parameters using the "A$" and "L$" commands. If a program went from 0300 to 0320, it would be (hex) 20 or (decimal) 32 bytes long. Therefore it would be saved by command:

```
*BSAVE MYPROGRAM,A$300,L$20
```

where A$ is the starting address in hexadecimal, and L$ is the length in hex. It could also be saved by the command:

```
*BSAVE MYPROGRAM,A768,L32
```

where A is the starting address in decimal (768=300 hex), and L is the length in bytes.

To check a program listing, enter the start and end address, separated by a period. For the short TONE program above, enter:

```
*300.308 <ret>
```

If you want to see the disassembled code, enter the starting address and "L" to list 20 commands. To see this program, enter:

```
*300L <ret>
```

(To make the entry and correction of machine language programs, one of the disks from the International

Apple Core (Disk 25, Machine Language Utilities) contains a utility to facilitate this process. It is called BEU (for Binary Entry Utility) and will locate itself either on a 16K RAM card or in the Apple's 48K RAM.) It is an excellent utility.

2) Programming with the Mini-Assembler

In the original Apple II (that had Integer Basic, not APPLESOFT) machine there was a monitor function entitled the "Mini-Assembler". Its job was to facilitate entry of machine code into the computer. When Applesoft was developed for the Apple II Plus (and IIe), this function (along with STEP and TRACE in the Monitor ROM) was deleted. That is the bad news. Now for the good news. If you have a 16K RAM card (or a IIe), loading Integer BASIC upon booting up the DOS 3.3 SYSTEM MASTER disk will load the Mini-Assembler into your machine. This can be accessed by entering Integer with the command:

```
]INT
```

which yields the ">" prompt. Then enter:

```
>CALL-151
```

to get the monitor "*" prompt. Then go to the Mini-Assembler with the command:

```
*F666G
```

which yields the exclamation (!) prompt.

The Mini-Assembler is still available to the owner of a 48K Apple II Plus, as it has been modified and included on the IAC Disk #25. Instructions for its use are given in an accompanying file, while more complete instructions are given in the Apple II Reference Manual. Apple IIe owners can access the Mini-Assembler through Integer BASIC.

3) Assembler

Once you've got your feet wet by gaining access to the Monitor and entering a hex listing, you will realize the fact that there has to be a better way. Obtaining an assembler is that way. There are at least ten commercially available editor/assemblers, and the perfect one is probably still to be written.

Buying an assembler is like obtaining any other software, as the amount of money to be spent and the configuration of your machine will be controlling factors.

Other aids

Other types of aids are also worthy of consideration. A disassembler is a handy tool which will permit you to take machine language (hexadecimal) code and re-convert it into an assembler source listing. From there, you can edit, alter and reassemble the code to make it function in a different manner or at a new memory location. A disassembler is available in the Apple's monitor and is able to disassemble to the screen, using the

```
*XXXX L<return>
```

command, where XXXX is the memory location at which to begin disassembly. A public domain disassembler is included on the machine language disk, and some very good disassemblers are included with some assemblers as part of the package (eg. Merlin and Lisa). Others are available as a stand-alone product (such as DISASM from RAKWARE).

Debuggers are for those who are very serious – they permit step and trace functions and a host of other advanced features. Two examples of commercial products are Bug Byter and Munch-a-Bug. BEU on the machine language disk also contains debug routines.

There is even a new product which will turn your machine into a "visible" Apple as it shows you on the Hi-Res screen how your Apple works, displaying the instructions, registers, flags and memory locations as it executes a program one step at a time.

And where would we be without books? A variety are available, each one for a slightly different reader. There are some general references on programming the 6502 microprocessors, several good books specifically written for Apple 6502 machine lanuage, and books which serve as a road-map or atlas to the Apple's internals. But the best starting place is the Apple II Reference Manual which lists the opcodes available on the 6502 and some important internal routines.

When all is said and done, those who know a few BASIC commands can easily find their way around machine language. There is a certain joy in entering, debugging and running a program, be it in BASIC, assembler or whatever. And isn't that joy a big reason for owning an Apple? ☐

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Reviews and programs

by Duncan McCann

BASIC, FORTH and Machine Language explained

The **Apple in Your Hand** is published by Ing. W. Hofacker GmbH, Tegernseerstr. 18, d-8150 Holzkirchen. Alert readers will have already worked out, correctly, that this book originated in West Germany. There is no author listed, although the copyright is in the name of Winifried Hofacker, who one would presume is the publisher.

The book starts off with a quite remarkable first paragraph.

"The Apple II and the Apple IIe are very popular computers. And most of the users have a lot of experience in programming. In most cases the programming language BASIC is used. The aim of this book is to show how to use machine code and the exciting language FORTH. Therefore this book is divided into three sections, BASIC, Machine Code and FORTH."

I am not in a position to comment on the situation in West Germany, but in Australia to say that "most of the users have a lot of experience in programming" is some considerable way from the truth. In fact, as Arthur in "Minder" would say, it's a little porkie.

Most computer users – Apple or any other make – are not programmers. They are users. It is only strange people like you and I that are programmers.

After this slightly false start the book gets into its stride, and it is an extremely useful text for the medium level programmer.

I truly wouldn't recommend it for your absolute beginner because so

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much information is packed into each page. But if you have a fair understanding of the principles of programming in BASIC, this book is well worth acquiring.

Many of the programs show some interesting programming techniques and there are several subroutines that are worth adding to a programmer's library. One self-contained program is called "Notebook". It runs as follows:

Notebook

The program NOTEBOOK uses double linked lists. There are two arrays used for the pointers R(i) and L(i). The pointer R(i) points to the next keyword which is greater, and points to the keyword which is smaller. One entry is logically right from the actual entry, the other is left from the entry. In the memory they are stored in different places.

In linking a double linked list there are five possibilities:

1. The list is empty. Then P=0.
2. There is only one entry. Then P=1, R(1)=0 and L(1)=0.
3. The next entry j is bigger than all entries in the list. Then R(j)=0, L(j)=k, R(k)=j. K is the number of the former last entry.
4. The next entry j is smaller than all entries. Then R(j)=p, L(j)=0, L(p)=j and P=j.
5. The next entry has to be placed between entry k and i. Then R(k)=j, R(j)=i, L(j)=k and L(i)=j.

This linking is programmed in lines 200-299.

Figure 2-17 shows the structure of the notebook.

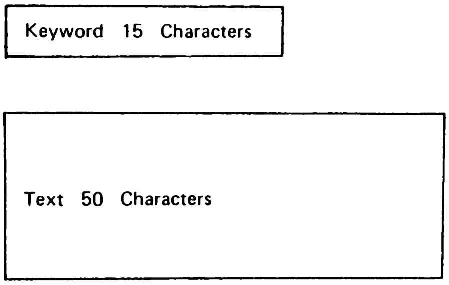

Figure 2-17: Structure of the Notebook

The length of the keyword is up to 15 characters and the length of one entry may have up to 50 characters. The input mode is entered by the word ENTRY. As an example we will use cities as keywords and make some remarks regarding these cities in our notebook.

E.G. KEYWORD: LAS VEGAS
TEXT: DON"T MIST THE SHOW AT CESARS

In the lower part of the screen appears the sign – >? Hitting the right arrow key lets one make another entry. Any other key causes the program to jump back to the menu.

To find an entry in the notebook one has to enter
SEARCH <KEYWORD>

For example
SEARCH LAS VEGAS

The keyword and the text is displayed on the screen. Now you see the signs <—> ? in the lower part of the screen. The left arrow key is used to step to the next smaller keyword or the right arrow key to the next bigger keyword in the notebook. The message END OF LIST is printed if one of either ends of the list is reached. Hitting any other key than the cursor keys cancels the stepping through the notebook and leads back to the menu.

The word PRINT prints all keywords sorted on the screen.

With WRITE <FILENAME> the notebook can be saved on disk. With READ <FILENAME> the notebook goes back into memory. The word END terminates the program.

```
100  N = 40:Z = 0:C = 0
105  DIM N$(N),R(N),L(N)
110  DIM K$(6),E$(N)
120  K$(1) = "ENTRY":K$(2) = "SEARCH"
130  K$(3) = "END"
140  K$(4) = "WRITE":K$(5) = "READ":
     K$(6) = "PRINT"
150  L$ = "                    ":
     REM  20 SPACES
160  D$ =  CHR$ (4)
199  GOTO 1000
200  REM  MAKE DOUBLE LINKED LISTS
210  R(1) = 0:L(1) = 0:
     P = 1
220  FOR J = 2 TO Z
230    I = P
250    IF N$(J) < N$(P) THEN R(J) = P:
       L(J) = 0:L(P) = J:P = J:
       GOTO 295
260    K = I:I = R(I)
265    IF I = 0 THEN R(K) = J:
       R(J) = 0:L(J) = K: GOTO 295
270    IF N$(J) < N$(I) THEN R(K) = J:
       R(J) = I:L(J) = K:L(I) = J:
       GOTO 295
290    GOTC 260
295  NEXT J
298  C = 1: RETURN
1000 HOME : VTAB 3: HTAB 5:
     PRINT "ENTRY"
1005 HTAB 5: PRINT "SEARCH <KEYWORD>"
1008 HTAB 5: PRINT "READ   <FILENAME>
1010 HTAB 5: PRINT "WRITE  <FILENAME>
1014 HTAB 5: PRINT "PRINT  (KEYWORDS)
1018 HTAB 5: PRINT "END"
1020 VTAB 20: INPUT " ? ";I$
1030 VTAB 20: PRINT L$
1040 L =  LEN (I$)
1050 FOR I = 1 TO L
1060   IF  MID$ (I$,I,1) = " " THEN  GOTO 1100
1070 NEXT I
1080 V$ = I$: GOTO 1110
1100 V$ =  LEFT$ (I$,I - 1):
     U$ =  RIGHT$ (I$,L - I)
1110 FOR I = 1 TO 6
1120   IF V$ = K$(I) THEN  GOTC 1200
1130 NEXT I
1140 GOTC 9000
1200 ON I GOTC 2000,3000,4000,5000,6000,
     7000
2000 REM  MAKE ENTFY
2005 HOME
2010 Z = Z + 1
2020 INPUT "KEYWORD: ";N$(Z)
2030 INPUT "TEXT:";E$(Z)
2040 VTAB 20: PRINT "—>"
2045 C = 0
2050 GET I$: IF  ASC (I$) = 21 THEN  GOTC 2005
2060 GOTC 1000
3000 REM  SEARCH
3010 HOME : IF C = 0 THEN  PRINT "I'M LINKING":
     GOSUB 200
3020 I = P
3030 IF I = 0 THEN  GOTC 3080
3040 IF N$(I) = US THEN  HOME :
     VTAB 2: PRINT N$(I):
     VTAB 4: PRINT E$(I):
     VTAB 20: PRINT "<— —>":
     GOTO 3100
3050 I = R(I): GOTC 3030
3080 VTAB 20: PRINT I$;" ? ":
     GOTO 9005
3100 GET I$:
3110 IF  ASC (I$) = 21 THEN K = I:
     I = R(I): GOTO 3200
3120 IF  ASC (I$) = 08 THEN K = I:
     I = L(I): GOTO 3200
3130 GOTC 1000
3200 HOME : IF I = 0 THEN  GOTC 3240
3210 VTAB 2: PRINT N$(I):
     VTAB 4: PRINT E$(I):
     VTAB 20: PRINT "<— -->":
     GOTO 3100
3240 PRINT "END OF FILE"
3250 I = K: GET I$: GOTC 3210

4000 VTAB 20: PRINT "WRITE TC DISK (Y/N)"
4010 GET I$: IF I$ = "Y" THEN  GOTC 1000
4020 END
5000 REM  WRITE TO DISK
5003 HOME
5010 PRINT D$;"OPEN";U$
5020 PRINT D$;"DELETE";U$
5030 PRINT D$;"OPEN";U$
5040 PRINT D$;"WRITE";U$
5050 PRINT Z
5060 FOR I = 1 TO Z
5070   PRINT N$(I):
     NEXT I
5080 FOR I = 1 TO Z
5090   PRINT E$(I):
     NEXT I
5100 PRINT D$;"CLOSE";U$
5110 GOTO 1000
6000 REM  READ FROM DISK
6010 ONERR  GOTO 9000
6020 PRINT D$;"OPEN";U$
6030 PRINT D$;"READ";U$
6040 INPUT Z
6050 FOR I = 1 TO Z
6060   INPUT N$(I):
     NEXT I
6070 FOR I = 1 TO Z
6080   INPUT E$(I):
     NEXT I
6090 PRINT D$;"CLOSE";U$
6095 PRINT "MUST LINK":
     GOSUB 200
6100 GOTO 1000
7000 REM  PRINT KEYWORDS
7005 IF C = 0 THEN  HOME :
        PRINT "I'M LINKING":
        GOSUB 200
7010  HOME :I = P:K = 0
7020  PRINT N$(I):I = R(I)
7030  IF I = 0 THEN  GOTO 7100
7040  IF K < 18 THEN K = K + 1:
        GOTO 7020
7045  VTAB 20: PRINT "—>"
7050  GET I$: IF  ASC I$ = 21 THEN  HOME :
        GCTO 7020
7060  GOTO 1000
7100  PRINT "END OF KEYWORDS":
        GET A$: GOTO 1000
9000  VTAB 20: PRINT V$;" ?"
9005  GET I$: GOTO 1000
```

Figure 2-18: Program Notebook

Three dimensional Apples

Phil Cohen wrote a book in 1983 called **The 3-D Animated Apple** (published by Prentice-Hall) and we have only recently fanged ourselves a copy. We have a strange idea that it was wafted away from the editorial desk on the day of its arrival and the culprit has only recently had an attack of conscience and returned it.

In a sense this book is the shape of things to come, as it follows a new practice of offering a disk with the book – the disk containing all the programs and subroutines included in the text.

This is an excellent idea, especially as the price of the disk is a reasonable $12, whilst the price of the book is $14.95, which is how publishers spell $15.

If you like to make your graphics more interesting than normal, this book is the one – perhaps that is going a little far, make it one of the ones – for you because of the way in which it takes you by the hand and walks you though the graphics process. It makes graphics illustration relatively easy.

The book lives up to the strict definition of its title because it does show you how to animate drawings and how to make them appear to be three dimensional on a strictly two dimensional screen. And appearance in graphics is, after all, everything.

To give you the essential flavour of the book here is how Phil Cohen approaches a shape table.

Using Make Shape

It is a good idea to sketch the shape first on graph paper. Then it becomes a simple matter to put it into the computer.

When the program is RUN, the top part of the screen (the graphics part) will go blank except for a dot near the middle.The text part of the screen will show this message:

```
U=UP  M  =  DOWN  K=RIGHT
H=LEFT   J=ON/OFF   F=FINISH
E=ERASE
```

The direction in which the drawing "dot" moves is determined by pressing the appropriate key. If you press, say, the U key, a short line segment will appear, starting at the dot in the middle of the screen. By pressing the U, M, H and K keys, you can make the line segments follow the shape that you want to draw.

You can move without drawing by pressing the J key which turns the line "on" and "off". If you press it once, you will find that the line on the screen is made up of dots; not a solid line. It will stay like this until you press the J key again. The dotted segments of the line will not appear on the screen in the final shape – they are only showing you where you have "moved" to (without drawing).

If you find that you have made a mistake, then you can use the E key to erase the last move. When you press the E key, the whole shape will disappear, and will be re-drawn with the last segment missing. You can then go on to complete the shape. When the shape is finished, you simply press the F key. This will cause the program to output the shape table entries.

If you are drawing a shape for use with the XDRAW command, it is worth remembering that for shapes where you want a line to "double back" on itself (e.g. when drawing the top of a "T", you would have to draw one "branch", then backtrack and draw the other), you will have to turn the line "off" when you are going over the previously drawn segment. If you "double draw" a segment of a line, then XDRAW the shape, drawing over the same line segment again will cause it to disappear!

When you press the F key, you will get the message:

```
NOW MAKING UP THE TABLE xxxxx
```

The binary values that make up the table entry will be displayed as the computer generates them. When that is finished, the program will ask you to select the form of output:

```
CHOOSE WHICH TYPE OF OUTPUT
(S=SCREEN, T=
TAPE, D=DISK)?
```

Type S, T or D, depending on what equipment you have available. If you have a disk drive, the computer will put a copy of the CATALOG onto the screen for you, and then ask for a file name. The table will be put into this file (which will be a text file) for later use by the COMBINE SHAPES program. If you have a tape recorder attached to the Apple, pressing T will cause the computer to pause for you to set the recorder up, and then save the table entries using the STORE command, which puts an array onto tape. The tape can also be used with the COMBINES SHAPES program later.

If you have neither tape nor disk, you will have to type S. This will display the shape table entries on the screen (going from left to right across the top, then to the next row). If you have a printer, you could use it to record the entries, but if you do not, then you will have to copy them by hand. Fortunately, most shapes are fairly small, and so this will not take you long.

MAKE SHAPE

```
10  DIM A%(100,2)
20  HGR
25  VTAB 24
30  HCOLOR= 3
40  HPLOT 140,80
50 X = 140:Y = 80
60 P = 1: REM  NEXT AVAILABLE ELEMENT
OF A%(,)
70 O = 1: REM  1=ON, 0=OFF IN ARRAY
ELEMENT 2
80  PRINT
90  PRINT "U=UP M=DOWN K=RIGHT H=LEFT
J=ON/OFF"
100  PRINT "F=FINISH E=ERASE"
110  REM
120  REM  DRAW SHAPE ON THE SCREEN
130  GET A$
140  IF A$ <  > "E" AND A$ <  > "F"
AND A$ <  > "U" AND A$ <  > "M"
AND A$ <  > "K" AND A$ <  > "H"
AND A$ <  > "J" THEN  GOTO 130
150  IF A$ = "E" THEN  GOSUB 1010
160  IF A$ = "E" THEN  GOTO 130
170  IF A$ = "F" THEN  GOTO 320
180  IF A$ = "U" THEN D = 0:Y = Y - 5
190  IF A$ = "M" THEN D = 2:Y = Y + 5
200  IF A$ = "K" THEN D = 1:X = X + 5
210  IF A$ = "H" THEN D = 3:X = X - 5
220  IF A$ <  > "J" THEN  GOTO 250
230  IF O = 1 THEN O = 0: GOTO 130
240 O = 1: GOTO 130
250  IF O = 1 THEN  HPLOT  TO X,Y:
GOTO 270
260  HPLOT X,Y
270 A%(P,1) = D:A%(P,2) = O
280 P = P + 1: IF P = 101 THEN
GOTO 320
290  GOTO, 130
300  REM
310  REM  SET UP FOR MAKING THE TABLE
```

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```
320  TEXT
330  PRINT : PRINT
340  PRINT "NOW MAKING UP THE TABLE"
350  DIM B%(101)
360 PA = 1:PB = 1: REM  POINTERS TO THE
ARRAYS
370 P = P - 1: REM   NOW MARKS LAST
ENTRY IN A%(,)
380 PR = 1: REM  MARKS WHICH PAIR IN THE
BYTE WE ARE AT
390  REM
400  REM  MAKE UP THE TABLE
410  REM  NEXT ONE
420  IF PA > P THEN  GOTO 530
430 O = A%(PA,2)
440 D = A%(PA,1)
450 D = D + 4 * O
460  IF PR = 1 THEN B%(PB) = D:PR = 2:PA
= PA + 1: GOTO 410
470  IF PR = 2 THEN B%(PB) = B%(PB) +
  8 * D:PA = PA + 1:PR = 3: GOTO 410
480  IF D > 0 AND D < 3 THEN B%(PB)
= B%(PB) + 64 * D:PA = PA + 1:PB = PB +
  1:PR = 1: GOTO 410
490  IF B%(PB) > 7 THEN PB = PB + 1:
PR = 1: GOTO 410
500 B%(PB) = B%(PB) + 64:PB = PB + 1:
PR = 2 :B%(PB) = 3: GOTO 410
510  REM
520  REM  END OF THIS PART
530  IF PR = 1 THEN PB = PB - 1:
GOTO 600
540  IF PR = 2 THEN  GOTO 580
550  IF B%(PB) > 7 THEN  GOTO 600
560 B%(PB) = B%(PB) + 64
570 PB = PB + 1:B%(PB) = 3: GOTO 600
580  IF B%(PB) > 0 THEN  GOTO 600
590 B%(PB) = B%(PB) + 200
600 PB = PB + 1
610 B%(PB) = 0
620  REM
630  REM  PUT THE RESULTS ONTO THE
SCREEN
640  FOR I = 1 TO PB
650 A = B%(I)
660  GOSUB 1220
670  PRINT A$
680  NEXT I
690  REM
700  REM  SAVE RESULTS
710  PRINT
720  INPUT "CHOOSE WHICH TYPE OF OUTPUT
(S=SCREEN, T=TAPE, D=DISC) ";A$
730  IF A$ = "S" THEN  GOTO 790
740  IF A$ = "T" THEN  GOTO 970
750  IF A$ = "D" THEN  GOTO 850
760  GOTO 710
770  REM
780  REM  OUTPUT TO SCREEN
790  FOR I = 1 TO PB
800  PRINT B%(I),
810  NEXT I
820  STOP
830  REM
840  REM  OUTPUT TO DISC
850  PRINT : PRINT  CHR$ (4);"CATALOG"
860  PRINT : INPUT "WHAT OUTPUT FILE
NAME ? ";O$
870  PRINT  CHR$ (4);"OPEN ";O$
880  PRINT  CHR$ (4);"WRITE ";O$
890  FOR I = 1 TO (PB - 1)
900  PRINT B%(I)
910  NEXT I
920  PRINT B%(PB)
930  PRINT  CHR$ (4);"CLOSE ";O$
940  STOP
950  REM
960  REM  OUTPUT TO TAPE
970  INPUT "SET TAPE TO RECORD, THEN
PRESS RETURN ";A$
980  STORE B%
990  STOP
1000  REM
1010  REM  ROUTINE TO ERASE AN ENTRY AND
RE-DRAW
1020  HGR
1030  HCOLOR= 3
1040 P = P - 1
1050 X = 140:Y = 80
1060  HPLOT X,Y
1070  FOR I = 1 TO P - 1
1080  ON A%(I,1) GOTO 1110,1130,1150
1090 Y = Y - 5
1100  GOTO 1160
1110 X = X + 5
1120  GOTO 1160
1130 Y = Y + 5
1140  GOTO 1160
1150 X = X - 5
1160 IF A%(I,2) = 1 THEN HPLOT TO X,Y
1170 IF A%(I,2) = 0 THEN HPLOT X,Y
1180  NEXT I
1190  RETURN
1200  REM
1210  REM  ROUTINE TO CONVERT DECIMAL TO
BINARY
1220 A$ = ""
1230  FOR J = 1 TO 8
1240 B = A -  INT (A / 2) * 2
1250  IF B > .5 THEN A$ = "1" + A$
1260  IF B < .5 THEN A$ = "0" + A$
1270 A =  INT (A / 2)
1280  NEXT J
1290  RETURN
```

Getting down to business

This is where people starting throwing things in protest and disagreement. But what is life without controversy?

BASIC Business Subroutines for the Apple II and IIe is the best book we have ever seen published on programming for Apples. Even more, it is one of the best books ever published on programming.

Why is this?

The authors, Alan G. Porter and Martin G. Rezmer, have published a book containing a series of subroutines you can use to build up a commercial program that will be bug free and that, beyond doubts, will work.

This is so rare in programming that any book that can almost guarantee you will get it right is some sort of a miracle. And yes, that is what this book is, some sort of a miracle.

It not only presents you with a series of excellent subroutines, it also gives you a basic framework into which to slot them and a ton of invaluable advice on when and how to knit the whole thing together as a cohesive whole.

Most books on computer programming either rocket away into the stratosphere, working on the basis that anyone who doesn't write in Assembly is, by definition, a cretin.

Or they talk down to you, so they read like "Bill and Ben meet the Flower Pot Men and learn BASIC".

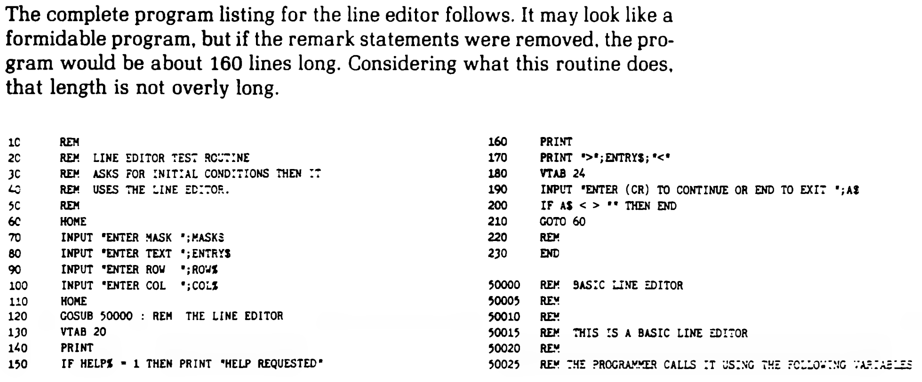
This book, miraculously, manages to balance neatly between the Scylla of overweening intellectual ostentation and the Charybdis of infantile gurglings.

If you read it and work on the examples and use the subroutines (all these are essential, for true knowledge does not come by a process of osmosis) then you will undoubtedly become an excellent programmer.

It is almost impossible to speak too highly of this book, which is in a class of its own. If you do not believe us, look at the elegance of their computer line editor program, which we reproduce here.

Complete Line Editor Program

The complete program listing for the line editor follows. It may look like a formidable program, but if the remark statements were removed, the program would be about 160 lines long. Considering what this routine does, that length is not overly long.



The complete program listing for the line editor follows. It may look like a formidable program, but if the remark statements were removed, the program would be about 160 lines long. Considering what this routine does, that length is not overly long.

```
10      REM
20      REM  LINE EDITOR TEST ROUTINE
30      REM  ASKS FOR INITIAL CONDITIONS THEN IT
40      REM  USES THE LINE EDITOR.
50      REM
60      HOME
70      INPUT "ENTER MASK ";MASK$
80      INPUT "ENTER TEXT ";ENTRY$
90      INPUT "ENTER ROW  ";ROW%
100     INPUT "ENTER COL  ";COL%
110     HOME
120     GOSUB 50000 : REM  THE LINE EDITOR
130     VTAB 20
140     PRINT
150     IF HELP% = 1 THEN PRINT "HELP REQUESTED"
160     PRINT
170     PRINT ">";ENTRY$;"<"
180     VTAB 24
190     INPUT "ENTER (CR) TO CONTINUE OR END TO EXIT ";A$
200     IF A$ < > "" THEN END
210     GOTO 60
220     REM
230     END

50000   REM  BASIC LINE EDITOR
50005   REM
50010   REM
50015   REM  THIS IS A BASIC LINE EDITOR
50020   REM
50025   REM THE PROGRAMMER CALLS IT USING THE FOLLOWING VARIABLES
```

```
50030  REM
50035  REM  ROW% => SCREEN LINE NUMBER
50040  REM  COL% => SCREEN COLUMN NUMBER
50045  REM  ENTRY$ => TEXT TO BE EDITED
50050  REM .MASK$ => DATA TYPE TO BE ALLOWED
50055  REM  WHERE:
50060  REM    A = ALPHANUMERIC
50065  REM    # = NUMBER FIELD ONLY
50070  REM    Y = YES/NO FIELD
50075  REM    Q = HELP REQUEST OK, USE IN ANY CHARACTER
50080  REM  THE LENGTH OF MASK$ IS THE MAXIMUM LENGTH OF THE
50085  REM  INPUT STRING
50090  REM
50095  REM
50100  PLACE% = 1              : REM  SET THE STARTING POSITION
50105  REM
50110  FILL$ = "."             : REM  DISPLAY DOTS
50115  HELP% = 0               : REM  CLEAR THE HELP FLAG
50120  CTRL% = 0               : REM  CLEAR THE EXIT FLAG
50125  GOSUB 52130             : REM  DISPLAY ENTRY$
50130  GOSUB 50165             : REM  EDIT THE STRING
50135  FILL$ = " "             : REM  CLEAR THE SCREEN
50140  GOSUB 52130             : REM  DISPLAY ENTRY$
50145  RETURN                  : REM  GO BACK TO CALLER
50150  REM
50155  REM  ***********************
50160  REM
50165  REM  EDIT THE ENTRY$ FIELD
50170  REM
50175  REM  POSITION THE CURSOR
50180  REM
50185  VTAB ROW%            : REM  VERTICAL POSITION
50190  GOSUB 52000          : REM  PRINT THE CHARACTER IN INVERSE
50195  REM
50200  REM  ACCEPT A KEY FROM THE KEYBOARD
50205  REM
50210  KEY% = PEEK (49152)     : REM  TEST FOR INPUT
50215  IF KEY% < 128 THEN GOTO 50210 : REM  LOOP UNTIL ENTRY
50220  REM
50225  REM  IF HERE THEN A KEY PUSHED
50230  REM
50235  XX = PEEK (49168)       : REM  CLEAR KEYBOARD
50240  KEY% = KEY% - 128       : REM  STRIP OFF FLAG BIT
50245  REM
50250  REM  PROCESS THE KEY
50255  REM
50260  GOSUB 50295             : REM  KEY% PROCESSOR
50265  IF HELP% > 0 THEN RETURN : REM  HELP REQUESTED BY USER
50270  IF CTRL% > 0 THEN GOSUB 52070: RETURN : REM  CONTROL KEY
                                                 EXIT
50275  GOTO 50210              : REM  GET THE NEXT KEY
50280  REM
50285  REM  ******************************
50290  REM
50295  REM  TEST FOR CONTROL KEY
50300  REM
50305  IF KEY% < = 31 THEN GOSUB 51000: RETURN : REM  PROCESS
                                                  AND RETURN
50310  REM
50315  REM  MUST BE AN ALPHANUMERIC
50320  REM
50325  REM  TEST THE MASK TO DETERMINE DATA TYPE
50330  REM
50335  IF MID$ (MASK$,PLACE%,1) = "A" THEN GOSUB 50900: RETURN
50340  IF MID$ (MASK$,PLACE%,1) = "#" THEN GOSUB 50390: RETURN
50345  IF MID$ (MASK$,PLACE%,1) = "Y" THEN GOSUB 50440: RETURN
50355  REM
50360  REM  BAD MASK CHARACTER
50365  REM
50370  RETURN
50375  REM
50380  REM  ********************************
50385  REM
50390  REM  ACCEPT A NUMBER
50395  REM
50400  REM  TEST TO SEE IF IT IS A VALID NUMERIC TYPE OF CHARACTER
50405  REM
50410  IF (KEY% < 45) OR (KEY% > 57) THEN RETURN : REM  BAD KEY
50415  IF KEY% = 47 THEN RETURN : REM  BAD KEY ALSO
50420  GOSUB 50900             : REM  GOOD KEY SO ACCEPT IT
50425  RETURN
50430  REM  ********************************
50435  REM
50440  REM  TEST FOR YES OR NO
50445  IF (KEY% < > 89) AND (KEY% < > 78) THEN RETURN : REM  BAD KEY
50450  GOSUB 50900                        : REM  ACCEPT IT
50455  RETURN
50460  REM  ********************************
50465  REM
50900  REM  PRINT KEY% AND ADD TO ENTRY$
50905  REM
50910  IF INSERT% = 1 THEN GOSUB 51315: REM  INSERT A SPACE
50915  TXTSIZE% = LEN (ENTRY$) : REM  MAKE SURE WE HAVE CORRECT
                                      TXTSIZE%
50922  REM  ADD TO END OF ENTRY
50925  IF PLACE% > TXTSIZE% THEN ENTRY$ = ENTRY$ + CHR$ (KEY%):
       GOTO 50945
50926  REM  ADD AS FIRST CHARACTER
50930  IF PLACE% = 1 THEN ENTRY$ = CHR$(KEY%) +
       MID$(ENTRY$,PLACE% + 1): GOTO 50945
50932  REM  ADD AS LAST CHARACTER
50935  IF PLACE% = TXTSIZE% THEN
       ENTRY$ = LEFT$(ENTRY$,PLACE% - 1) + CHR$(KEY%): GOTO 50945
50936  REM  ADD IN THE MIDDLE SOMEWHERE
50940  ENTRY$ = LEFT$(ENTRY$,PLACE% - 1) + CHR$(KEY%)
       + MID$(ENTRY$,PLACE% + 1)
50945  TXTSIZE% = LEN (ENTRY$)
50946  REM  IF TOO BIG TRUNCATE IT
50950  IF TXTSIZE% > MAXSIZE% THEN ENTRY$ = LEFT$ (ENTRY$,MAXSIZE%)
50955  REM
50960  REM  NEED TO MOVE RIGHT ONE PLACE
50965  REM
50970  GOSUB 51425                : REM  RIGHT ARROW
50975  RETURN
50980  REM
50985  REM  ***************************
50990  REM
51000  REM  PROCESS A CONTROL KEY
51005  REM
51010  REM  EXIT KEYS SUCH AS RETURN SET CTRL%
51015  REM
51020  REM
51025  REM  ^A = 1  > PREVIOUS WORD
51030  REM  ^D = 4  > DELETE THIS CHARACTER
51035  REM
51040  REM  ^F = 6  > FILL WITH A SPACE
51045  REM  ^H = 8  > LEFT ARROW
51050  REM  ^N = 14 > SKIP TO END
51055  REM  ^Q = 17 > HELP REQUEST
51060  REM  ^U = 21 > RIGHT ARROW
51065  REM  ^W = 23 > NEXT WORD
51070  REM  ^Y = 25 > ERASE TO END
51075  REM  IGNORE ALL OTHER KEYS
51080  REM
51085  CTRL% = 0                    : REM  CLEAR EXIT FLAG
51090  IF KEY% = 6 THEN GOSUB 51280: RETURN : REM  INSERT
51095  INSERT% = 0                  : REM  TURN INSERT OFF
51100  IF KEY% = 1 THEN GOSUB 51555: REM  PREVIOUS WORD
51105  REM
51110  IF KEY% = 4 THEN GOSUB 51210: REM  DELETE
51115  REM
51120  IF KEY% = 8 THEN GOSUB 51380: REM  LEFT ARROW
51125  REM
51130  IF KEY% = 13 THEN CTRL% = 1: REM  RETURN KEY
51135  REM  CHECK HELP REQUEST
51140  IF KEY% = 17 THEN HELP% = 1 : RETURN : REM  HELP REQUEST
51145  REM
51150  IF KEY% = 14 THEN GOSUB 51680: REM  GOTO END
51155  REM
51160  IF KEY% = 21 THEN GOSUB 51425: REM  RIGHT ARROW
51165  REM
51170  IF KEY% = 23 THEN GOSUB 51475: REM  NEXT WORD
51175  REM
51180  IF KEY% = 25 THEN GOSUB 51630: REM  ERASE TO END
51184  IF KEY% = 27 THEN CTRL% = 27 : RETURN : REM  ESC
51185  REM
51190  RETURN
51195  REM
51200  REM  ********************************
51205  REM
51210  REM  DELETE AND PACK
51215  REM
51220  TXTSIZE% = LEN (ENTRY$)
51225  IF TXTSIZE% = 0 THEN RETURN : REM  NOTHING TO DELETE
51230  IF TXTSIZE% = 1 THEN ENTRY$ = "":PLACE%
       = 1:GOTO 51250: REM  DELETE LINE
51235  IF PLACE% = 1 THEN ENTRY$ = MID$ (ENTRY$,2): GOTO 51250
51240  IF PLACE% > = TXTSIZE% THEN
        ENTRY$ = LEFT$(ENTRY$,TXTSIZE% - 1):PLACE% = PLACE%
         - 1:GOTO 51250
51245  ENTRY$ = LEFT$ (ENTRY$,(PLACE% - 1)) + MID$ (ENTRY$,PLACE% + 1)
51250  GOSUB 52130         : REM  PRINT NEW STRING
51255  GOSUB 52000         : REM  PRINT INVERSE
51260  RETURN
51265  REM
51270  REM  ********************************
51275  REM
51280  REM  TOGGLE THE INSERT MODE
51285  REM
51290  IF INSERT% = 1 THEN INSERT% = 0: RETURN : REM  TURN IT OFF
51295  INSERT% = 1         : REM  TURN IT ON
51300  RETURN
51305  REM  ********************************
51310  REM
51315  REM  INSERT A CHARACTER
51320  REM
51325  REM
51330  REM  IS IT THE FIRST CHARACTER?
51335  IF PLACE% = 1 THEN ENTRY$ = " " + ENTRY$: GOTO 51350
51340  REM  INSERT IN THE MIDDLE
51345  ENTRY$ = LEFT$ (ENTRY$,PLACE% - 1) + " " + MID$ (ENTRY$,PLACE%)
51350  GOSUB 52130         : REM  PRINT THE FIELD
51355  GOSUB 52070         : REM  REPOSITION CURSOR
51360  RETURN
51365  REM
51370  REM  ********************************
51375  REM
51380  REM  LEFT ARROW
51385  REM
51390  GOSUB 52070        : REM  DISPLAY NORMAL
51395  IF PLACE% > 1 THEN PLACE% = PLACE% - 1: REM  MOVE LEFT ONE
51400  GOSUB 52000        : REM  DISPLAY INVERSE
51405  RETURN
51410  REM
51415  REM  ********************************
51420  REM
51425  REM  RIGHT ARROW
51430  REM
51435  IF MID$ (ENTRY$,PLACE%,1) = "" THEN RETURN
51440  GOSUB 52070        : REM  DISPLAY AS NORMAL
51445  IF PLACE% < MAXSIZE% THEN PLACE% = PLACE% + 1
51450  GOSUB 52000        : REM  DISPLAY AS INVERSE
51455  RETURN
51460  REM
51465  REM  ********************************
51470  REM
51475  REM  SKIP TO NEXT WORD
51480  REM
51485  REM
51490  IF PLACE% = > TXTSIZE% THEN RETURN : REM  ALREADY AT END
51495  GOSUB 52070        : REM  REMOVE CURSOR
51500  PLACE% = PLACE% + 1: REM  LOOK FOR FIRST SPACE
51505  IF PLACE% = TXTSIZE% THEN GOTO 51530
51510  IF MID$ (ENTRY$,PLACE%,1) < > " " THEN GOTO 51500:
       REM  IS IT A SPACE?
51515  PLACE% = PLACE% + 1: REM  MOVE RIGHT ONE
51520  IF PLACE% = TXTSIZE% THEN GOTO 51530
51525  IF MID$ (ENTRY$,PLACE%,1) = " " THEN GOTO 51515:
       REM  SKIP OVER SPACES
51530  GOSUB 52000        : REM  DISPLAY CURSOR
51535  RETURN
51540  REM
51545  REM  ********************************
51550  REM
51555  REM  SKIP TO PREVIOUS WORD
51560  REM
51565  IF PLACE% = 1 THEN RETURN : REM  AT THE FRONT ALREADY
51570  GOSUB 52070        : REM  REMOVE CURSOR
51575  PLACE% = PLACE% - 1: REM  LOOK FOR SPACE
51580  IF PLACE% = 1 THEN GOTO 51610:
       REM  FORCE MOVE AT LEAST ONE SPACE
51585  IF MID$(ENTRY$,PLACE%,1) = " " THEN GOTO 51575:
       REM  SKIP OVER SPACES
51590  PLACE% = PLACE% - 1
51595  IF PLACE% = 1 THEN GOTO 51610
51600  IF MID$(ENTRY$,PLACE%,1) < > " " THEN GOTO 51590:
       REM  IS IT A SPACE?
51605  PLACE% = PLACE% + 1 : REM  POSITION OVER FIRST LETTER
51610  GOSUB 52000         : REM  DISPLAY THE CURSOR
51615  RETURN
51620  REM
51625  REM  ********************************
51630  REM  ERASE TO END OF LINE
51635  REM
51640  IF PLACE% = 1 THEN ENTRY$ = "": GOTO 51650:
       REM  ERASE WHOLE LINE
51645  ENTRY$ = LEFT$ (ENTRY$,PLACE% - 1)
51650  GOSUB 52130         : REM  PRINT THE FIELD
51655  GOSUB 52000         : REM  DISPLAY THE CURSOR
51660  RETURN
51665  REM
51670  REM  ********************************
51675  REM
51680  REM  SKIP TO END OF LINE
51685  REM
51690  GOSUB 52070         : REM  MOVE THE CURSOR
51695  PLACE% = LEN (ENTRY$) + 1
51700  IF PLACE% > MAXSIZE% THEN PLACE% = MAXSIZE%:
       REM  DO NOT GO PAST END
51705  GOSUB 52000         : REM  SHOW THE CURSOR
51710  RETURN
51715  REM
51720  REM  ********************************
51725  REM
52000  REM  PRINT CHARACTER IN INVERSE
52005  REM  THIS GIVES THE ILLUSION OF CURSOR MOVEMENT
52010  REM
52012  VTAB ROW% : REM  POSITION CURSOR
52015  POKE 36, (COL% + PLACE% - 1) : REM  HTAB
52020  INVERSE                : REM  REVERSE VIDEO
52025  XX$ = MID$ (ENTRY$,PLACE%,1): REM  MOVE FOR THE NEXT IF
52030  IF XX$ = "" THEN XX$ = " ": REM  IF NULL MAKE IT A SPACE
52035  PRINT XX$;                    : REM  PRINT THE INVERSE
52040  NORMAL                        : REM  RESTORE TO NORMAL VIDEO
52045  POKE 36, (COL% + PLACE% - 1) :
       REM  REPOSITION THE CURSOR - HTAB
52050  RETURN
52055 REM
52060 REM  ********************************
52065 REM
52070 REM  POSITION AND DISPLAY NORMAL
52075 REM
52077 VTAB ROW% : REM  POSITION CURSOR
52080 POKE 36, (COL% + PLACE% - 1) : REM  HTAB
52085 XX$ = MID$ (ENTRY$,PLACE%,1) : REM  PRINT ONE LETTER
52090 IF XX$ = "" THEN XX$ = FILL$ : REM  IF NULL THEN MAKE IT A SPACE
52095 PRINT XX$;
52100 REM
52105 POKE 36, (COL% + PLACE% - 1) : REM  REPOSITION THE CURSOR
52110 RETURN
52115 REM
52120 REM  ********************************
52125 REM
52130 REM  DISPLAY TEXT$
52135 REM  FILL$ IS THE FILL CHARACTER
52140 REM  TXTSIZE% IS THE LENGTH OF ENTRY$
```

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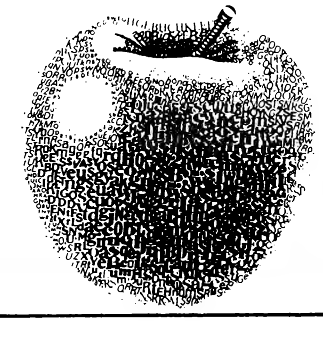

PROGRAMMING

```
52145 REM  MAXSIZE% IS THE MAXIMUM ALLOWED LENGTH
52150 REM
52155 REM
52160 TXTSIZE% = LEN (ENTRY$)  : REM  HOW LONG IS THE CURRENT FIELD?
52165 MAXSIZE% = LEN (MASK$)   : REM  WHAT IS MAX LENGTH ALLOWED?
52170 REM
52175 REM  IS ENTRY$ TOO LONG?
52180 REM
52185 IF TXTSIZE% > MAXSIZE% THEN
       ENTRY$ = LEFT$ (ENTRY$,MAXSIZE%):TXTSIZE% = MAXSIZE%
52190 REM
52195 REM  POSITION THE CURSOR
52200 REM
52205 VTAB ROW%                : REM  ROW POSITION
52210 POKE 36, COL%            : REM  COLUMN NUMBER - HTAB
52215 REM
52220 REM  PRINT THE TEXT
52225 REM
52230 PRINT ENTRY$;            : REM  NO LINE FEED
52235 REM
52240 REM  PRINT THE FILL CHARACTER
52245 REM
52250   IF TXTSIZE% = MAXSIZE% THEN RETURN : REM  NO FILL$ TO PRINT
52255   FOR XX = TXTSIZE% TO MAXSIZE% - 1
52260   PRINT FILL$;
52265   NEXT XX
52270   RETURN                      : REM  ALL DONE
52275   REM
52280   REM  *******************************
52285   REM
60000   RETURN          : REM  UNIVERSAL RETURN FOR TESTING
```

A final point.

The book is published by Addison-Wesley at $14.95 ($15 minus a zac to normal sentient human beings). We were led to understand that a disk would be available to go with the book at a reasonable price, and we held up this review until the alleged disk became available. It still has not arrived.

It would appear that Addison-Wesley are still using mule train to effect delivery from the United States. If you should buy this book – and you should if you have any interest whatsoever in programming, you really should – you will need the disk to save you from hammering in twelve miles of programs.

If the disk is not available at the time of purchase of the book, the person you want to harass is Mary McNamara at Addison-Wesley. Her number is 888 2733.

We are sure she will be looking forward to hearing from you. ☐

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Worm in the Apple

Is it possible that Apple management is becoming human and humble enough to admit their mistakes? Despite all rumours to the contrary it does appear to be the truth.

Take the strange case of Jon Covington (no relation that I know of to Judy of "Don't Cry for me Argentina" but you can never be certain) who has admitted, according to my Oriental Cousin Confucius Worm, that Apple management have made several errors in their handling of the fake Apple situation in Asia.

God bless my wormish soul. I never thought I would hear such an admission from an Apple executive. Certainly not from one based in Cupertino, from whom all blessings flow. But indeed he admitted in public that Apple management were too little and too late in the handling of the fake Apple situation.

What next?

John Sculley admitting that he drinks Coca Cola in preference to the other stuff.

****

My Korean cousin, Kimchi Worm, has relayed to me a story which is passing strange.

First he tells me that the monitors for the Apple IIe are made by a company called Samsung in Korea. South Korea that is. This, indeed, I knew, for many are the lamentations made by service engineers about their Mean Time Between Failures. It seems that it is not as long as they would like.

But this is not the strange part of the story.

Where the strangeness comes in is when we read of fake Apples being made in Korea.

Naughty Apple DOS compatible machines being made in flagrant disregard for the famous Naughty and Illegal Fake Apple Law which is observed with scrupulous honesty by all Asiatic countries.

The suggestion has been made that one of the manufacturers of these machines is a subsidiary of Samsung. This I totally refuse to believe. A worm can only be so gullible.

How could it possibly be that Apple were trading, as it were, with the enemy?

Even the youngest worm in Apple's purchasing department in Cupertino couldn't be that cretinous. Of this, I am quite certain.

****

Even worms by now know that the Macintosh is named after a type of Apple. Originally it was apparently given a woman's name not a million kilometres from "Betty", but the designers thought this was blatant sexism and changed it to the bisexual Macintosh (one can wear the sporran inside or outside the kilt, as one chooses).

This worm is willing to believe this is indeed true, because all the manuals and publicity for the Macintosh featured aggressively large, intelligent, under 25 year old, White Anglo Saxon Protestant males. Not a worm in sight. Nor a woman for that matter.

Now they are using the names of different types of Apple to designate different models, I trust they will have the good sense to stay away from the name "Granny Smith". For then they could be accused of both sexism and fruitism.

****

My English cousin, Montmorency Worm, reports that all is quiet on the Pommy Apple front, where you may remember during the dreaded "Night of the Generals" nearly all the management staff was removed in a slashing attack. Not surprising when you note that the new management came from Gillette razor blades.

Everything has now settled down at Apple headquarters, where they prepare to fight the good fight for the education market. Montmorency, a nice chap if a Pom, reports that in England the education market is divided neatly between two companies – and no one else gets a look in because the central education authority only pays out its 50% subsidy on these two machines. And neither of them is an Apple.

However, the agreement runs out in March next year, when the land will be alive with the cry of enraged personal computer salesmen hurling themsleves against the barricades in order to storm these castles of learning.

I wouldn't be surprised if the new managing director of Apple in the UK calls for a kamikaze attack from his troops. What have they to lose?

On past records, nothing but their jobs, says Montmorency Worm.

******

Rumour, which was ever a lying jade, suggests that David Roman, the man in charge of marketing Apples in Australia, has been seen walking around the Stately Pleasure Dome in Ryde holding an old used radio valve and muttering to himself.

Has the strain finally got to him? Are we to expect little men in white coats to front up and take him away to a quiet room with a nice view and padded walls?

The official explanation is that he is rehearsing a speech. It never ceases to amaze me the drivel that Apple expect us poor worms to believe.

****

The scene was the computer show at the Sydney showground

during the Australian Computer Society's annual bean feast.

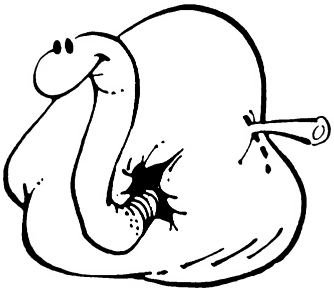
Apple had a stand manned by numerous toothsome ladies. One was approached by a country yokel who asked where the gents were.

Imagine his astonishment when he was congratulated on having won a Lisa computer.

He explained that he was not in the trade. was not buying a computer. All he wanted to find was the gents.

"Quite correct, sir", he was told. "You have won the prize of a Lisa computer because you are the first genuine enquiry we have had all week."

I am assured that this story is the literal truth. And if I had not been to the showground and seen those wide open rain swept spaces staffed by furtive sales people desperate for a customer, I would never have believed it. But I went, I saw, I believed. □



Beagle Brothers "Apple Mechanic"

BOOK REVIEW

Beagle Brothers "Apple Mechanic"

Before anyone starts slapping copyright suits on us, we apologise. It is true that Beagle Brothers own the absolute copyright to the programs and books they publish. But with great and good generosity, they keep all their programs copyable. And the way in which they write their instruction book is a lesson to everyone in urbane, humorous technical writing.

We do not know whether there are two brothers known as Beagle. Indeed, we cannot easily accept that they appear as they do on the logo at the top of all their programs.

However, if Mr and Mrs Beagle existed and had two sons – even if one of them was named Bert Kersey and the other Jack Cassidy – then we present them with our congratulations on bearing children who have done much to make the Apple computer popular.

In their book/disk **Apple Mechanic** they have so many tips it is difficult to know where to start.

One they mention is well known to us.

If you are having trouble booting a disk then boot your master disk and type in "BRUN MASTERCREATE".

You will be asked to type in the name of your booting program, which is normally "Hello", and then it will rewrite tracks 0-2, which is DOS, for you. The result may well be that the disk will now be usable. It will certainly boot. This will not of course work if there has been physical damage to the disk.

Another goody. "One way to tell the size of a program is to save it and look in the catalog. Every sector, not counting the first one, is about 246 bytes in size. Divide the sector count by four and you have roughly the size of the program in Ks. For example, a 48 sector file occupies about 12 K or 12,000 bytes."

One of the nicer stories concerns customising an Apple.

"Peter Lake, from somewhere-out-there, called us here at the Beagle Building to report on his customized Apple environment. It seems Peter is a professional writer and uses an Apple as a word processor all day, every day.

"So he mounted his system on a drawing board tilted at about 15 degrees. To level his monitor, he built a wedge shaped mount that rests on his Apple. He painted the Apple case black to reduce glare and, inspired by one of our tips, glued sequins to his K and D keys so he can feel his fingers' position on the keys without looking.

"Now the best part. He sits in a special race car seat, head rest and all, leans back and types away. I asked him if he wears a seat belt; he said 'Only when I type fast'."

Now, that is what is called style.

Under the heading "Watch your 3s and 2s" we find this useful piece of advice.

"Don't fret if you have to look at keys when you type numbers. Mistyped numbers are the source of some of the toughest programming mistakes to find. I've found it pays to slow your typing down about two beats when numbers come up, and it doesn't hurt to watch what you're doing either."

If only all manuals were as witty and urbane as this one then reviewing would be an eternal pleasure.

□

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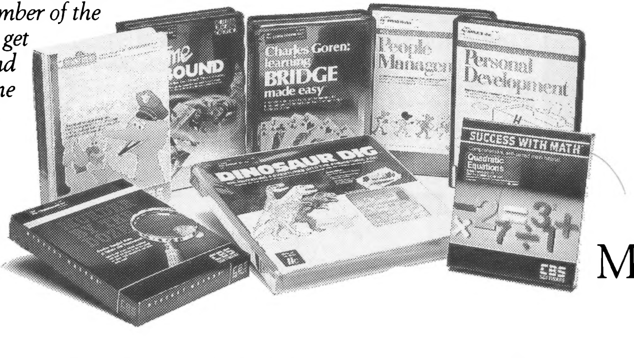

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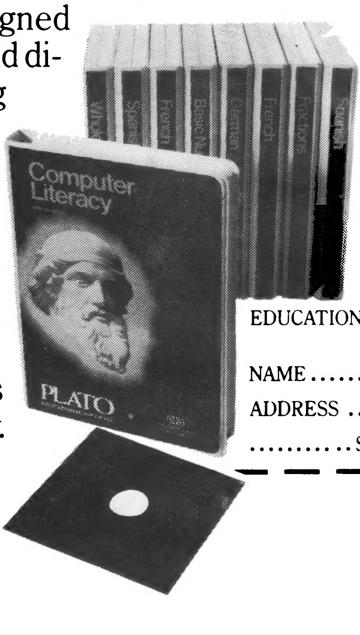

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